California Redwood Park

B352
CALIF.

F. Wood
Ben Wood

Stage Coach in Fire-Hollowed Redwood.

California Redwood Park

Sometimes Called

Sempervirens Park

An Appreciation

FRIEND WM. RICHARDSON, SUPERINTENDENT OF STATE PRINTING
SACRAMENTO, CALIFORNIA
1912

GRAY countries and grim empires pass away,
And all the pomp and glory of citied towers
Goes down to dust; and youth itself shall age.
But, oh, the splendor of this autumn dawn,
This passes not away! This dew-drenched range,
This infinite great width of open space,
This cool, keen wind that blows like God's own breath
On life's once drowsy coal, and thrills the blood,
This brooding sea of sun-washed solitude,
This virginal dome of open air—
These, these endure, and greater are than grief!
Still there is strength; and life, oh, life is good!
Still the horizon calls, the morrow lures;
Still hearts adventurous seek outward trails;
Still, still life holds its hope!
For here is air and God's good greenness spread!

—*Arthur Stringer.*

As a recognition of her generous and timely aid and inspiration in the acquisition and development of this forest park, for the people, this work is respectfully dedicated to

MRS. PHOEBE A. HEARST.

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LIST OF ILLUSTRATIONS.

1. Frontispiece.
   Stage Coach in Fire-Hollowed Redwood.
2. Father of the Forest.
3. Mother of the Forest.
4. Growing Trees on Upturned Stump.
5. The Cloistered Aisle.
6. Scene on Sempervirens Creek.
7, 8. Manzanita in Bloom.
   Ceonothis or Wild Lilacs.
9. Toyon, or Christmas Berry.
10. Scene on Opal Creek.
11. Berry Creek Falls.
12. The Chieftain.
13. United Oak.
14. Pine and Oak.

CONTENTS.

PAGE

GENESIS OF THE BIG BASIN 3

Geologic Record Showing Remarkable Upheavals and Contortions—The Lay of the Land as It Was Left for Vegetable and Animal Life.

IN PRIMEVAL TIMES 6

Aboriginal Sequoias of Stupendous Size—Animals Which Occupied the Wilderness.

EARLY HISTORY OF THE FOREST 9

When It Stretched from the Bay of Monterey to Yerba Buena, Ralph S. Smith Sought to Save a Remnant—Described by Ferdinand Lee Clark—The Forest as Revealed to Early Visitors.

"SAVE THE REDWOODS" 22

Years of Quiet Agitation—The Organization and Work of the Sempervirens Club.

FIRST IMPRESSIONS 28

Extracts from Articles Written by W. W. Richards, Mrs. Stephen A. Jones, Edwin Sidney Williams, and Josephine Clifford McCracken.

FATHER KENNA'S ACCOUNT 34

A Patriotic Friend of the Park and Prime Mover for Its Preservation.

PURCHASE OF THE PARK 38

The First Commission—Investigation and Negotiations—Timber Value of the Tract—Governor's Camp.

THE TRACT ACQUIRED 43

Three Thousand Eight Hundred Acres in Extent—Quarter of a Million Dollars Paid—General Topography—Aspect and Elevations.

THE BIG FIRE 47

A Twenty Days' War with Wild Fire—One Third the Area of the Park Invaded by Flames—A Redwood that Burned for Fourteen Months.

TIMBER CUTTING 52

Brief Account of the Infamous "Rape of the Redwoods."

FOLLOWING THE FIRE 54

Building of Fire Trails—Other Permanent Improvements on the Property.

PAGE

GOING IN ... 56
Scenic Features of the Highway from Boulder Creek—Changing Seasons Reflected in Variegated Landscape.

ROCKS AND STREAMS ... 59
Miles of Running Brooks—Numerous Cascades and Waterfalls—Quaintly Chiseled and Wave Worn Rocks.

FLORA OF THE PARK ... by *Isabel McCracken* 65
A Botanical Survey of the Trees, Shrubs, Plants, and Wild Flowers in the Park.

THE CAVE ... 82

LIGHT AND SHADOW IN THE PARK ... by *Virginia Garland* 84
Inlook of an Artistic Eye—Nature's Half Hidden Secrets—Revelations of Flowing, Falling Water—The Beauty that Must Be Sensed as Well as Seen.

AUTUMN COLOR ... by *Virginia Garland* 94
When Leaves and Berries and Bark Are Tinted in Scarlets and Crimsons, in Bright Yellows and Striking Blues.

FUNGI GARDENS ... by *Virginia Garland* 98
Another World of Beauty Under Cover of Fallen Foliage—In the Mushroom Kingdom.

BIRD LIFE IN THE PARK ... by *Virginia Garland* 102
Its Presence Easily Discovered by Those with Eyes to See and Ears to Hear—Practical Pointers for Those Desiring to Form Their Acquaintance.

THE GREEN PEOPLE ... by *Virginia Garland* 110
Our Relations to the Race that Dwelt in These Regions Before Our Time.

THE REDWOOD ... 117
Character of Tree—Its Ancient Lineage—Life History Non-Inflammable Nature—As Pictured by Delmas.

SENTIMENT AND SHINGLES ... 125

TRIBUTES BY FAMOUS POETS ... 8, 33, 42, 93, 101, 115
Joaquin Miller—Charles Keeler—Dr. C. W. Doyle—A. D. Nordhoff—Charles Elmer Jenny—Bret Harte.

A FOREWORD.

California's Redwood Park Commissioners put forth this booklet, for the double purpose of conveying to the people of the State a better knowledge and a keener appreciation of the State's forest reservation, and also to impress upon the people the importance of securing for State ownership the entire area of the Big Basin.

This task was entrusted to the Secretary, to whom it has been a literal labor of love, and the same can be said of the others whose writings are embodied herein. A too common idea of a forest is of sombrous silence. There is silence in this place, but it is a silence in which the voices of creation can be heard. There is majesty and sublimity in these time-defying trees, but as we have tried to show, there is also in this wood beauty and color, and woodland life in many manifestations. This forest is an aggregation of arboreal wonders. It is moreover a cathedral, a university, a sanatorium, a source of solace to the soul, an inspiration to the intellect, a tonic to the body.

California is munificent with her penal institutions, with her national guard and asylums. Will the reader help us to secure as liberal consideration for Sempervirens Park?

ARTHUR A. TAYLOR,
Secretary,
California Redwood Park Commission.

September, 1912.

THE ever green bowl of the Big Basin brims over with secrets. Half whispered lures beckon down the trails, elusive meanings lie in the dreamy hollows, fleeting significance brushes past our ears in the flutter of bird wings, and the great trees shed upon us an atmosphere of living light and shadow that tests and tries, while it heals our world-troubled spirits. We do not know why we are alternately comforted and made restless, why in rare, flashing moments, our hearts ache with the ecstacy of a piercing truth; for we live mostly in a world of perverted meanings, and the vague insight of life so diametrically opposed to our general existence, stirs, disturbs, before it can soothe.

If the iron is not too heavy in our souls, we know that we need Nature, but we go to the fields and the forests in hordes, we cling together in crowds, we travel far to hear the voice of a mountain stream; but we secure to ourselves the chatter of our own kind within call.

Then the half-told stories of the Open are not always happy lures. Sometimes the riddles hurt, are too hard to even dream of solving; yet if we only hear the faint, far echo of the everlasting question, not knowing that it is a question, hearing only the unintelligible, eternal murmur, we are not in the forest in vain.

Virginia Garland.

Genesis of Sempervirens Park.

N the beginning there was chaos, then the vasty deep, then a convulsion that upheaved the bottom of the sea and it became dry land, followed by those incomprehensible æons of time which we call geological periods, during which the forces of Nature were working with a zeal and a patience infinite in their scope to prepare for the presence of man on this planet.

In this region creative power was manifested in a peculiar manner. The magnitude and the intensity of the titanic throes of the Earth Mother here are beyond the reach of the imagination, beyond the grasp of scientific certainty.

Geologic stratas were uplifted by earthquakes, burned through, fused, intermixed by volcanic action, purged by torrential downpours, scoured by floods, seared by heat in a way and to a degree quite out of the ordinary method of world making.

The chalybeates and the sulphurs and the salts found elsewhere in deposits, are here diffused and dispersed, impregnating the springs and forming a widely distributed distillate for tree nutrition.

The mutation theory has been worked out with soils and sandstones, as man has demonstrated it with flowers

and plants. Thus it is that the geologist of to-day traverses this territory hammer in hand, knocks at every rock and boulder and looks and listens only to be amazed and dumbfounded. He tries to classify and describe, but he ends in uncertainty and doubt.

Dr. J. C. Branner, head of the department of geology in the Stanford University, who with assistants procured the data for the government geologic atlas of this region, states therein:

> Above the basement complex of acidic plutonic rocks and metamorphic schists and limestones, the age of which is uncertain, there are represented within the Santa Cruz quadrangle alone fourteen recognizable formations. Nine distinct and far-reaching disturbances, as recorded by profound inconformities, not to mention many local readjustments, took place in the region during the deposition of these formations. Volcanism was active during several epochs, and at least one of them lasted for a considerable time.
>
> The structure is complex. In many places the strata are intensely folded, faulted and crushed. Faulting, folding and crushing have doubtless been going on in this area since early geologic times. The rock surface exposed is too small and the geology too complex to afford any clear conception of the physical geography of the past. The rocks occur in such confusion, so faulted, altered, decomposed, that their sequence has not been clearly made out.

Doubtless Nature had her mind on doing some distinctive, transcendent thing in this territory.

What we know is that when the caldron was allowed to cool, there was left a more or less broken and detached

range of mountains, ten to fifteen miles from the ocean, with elevations of from 2,000 to 3,500 feet. Living waters flowed from their sides and their interception of the rain clouds traveling inland from the ocean gave a heavy precipitation to all the region. Thus came running streams in profusion, plowing their swift courses to the sea, eroding V-shaped valleys.

In one instance this seaward flow was intercepted by spurs from the mountain range, and three streams and their tributaries converged into one before finding an outlet through a cleft in the granite-ribbed buttress that bounds the tract on the south.

This peculiar conformation enclosed an area of approximately 14,000 acres, and when the California pioneer came upon the scene he called this the Big Basin to distinguish it from the narrower basins or valleys of other streams.

In Primeval Times.

LIFE, cataclysmal life, which manifested itself here with such fervor and intensity in the geological formation and topographical contour of this territory, imparted an equally phenomenal vitality to the animal and vegetable creation. Fossilized and entombed in the rocks, evidences of the marine life of this region are abundant.

Its ever-virile character is shown in the survival of that peculiar tree of the past we call the Sequoia, which not only awes us into silence and adoration as we stand before its living presence, but which by the visible tokens of prior generations takes our thought and our imagination back into the abysmal depths of time, before history was written, before tradition preserved the records of the human race.

The *Sequoia sempervirens* (Redwood) propagates itself more generally from stump shoots than from seed. Sometimes we find the offspring circled around the parent tree for two and three generations. In instances, oft-repeated in a redwood forest, the parent tree grew, lived, ripened, decayed and died, and with a speed incomprehensible for its slowness, passed back to earth and air, leaving a crater-like cavity where once its trunk was reared.

There were giants in those days.

The primeval redwood, not content with a circular expansion of forty, or fifty, or sixty, or seventy-five feet,

often stretched its mighty bole over an area ninety feet in circumference.

These stupendous craters are found here up to altitudes of 2,000 feet, mute monuments to the continuity of life, surpassing sworn statements in the integrity of their testimony to the vivifying and revivifying influences of the soil and climate.

When modern man appeared upon this scene (only sixty years ago) he found the tract, which he called the Big Basin, as viewed from its rim, a sea of tree tops, difficult to penetrate by reason of its redundant undergrowth, occupied by a population apparently able to hold its own against intruders.

Grizzly bears were numerous and not bashful, cougars abounded, wild cats were plentiful as were lesser animals of the predatory class.

But then, as now, the lure of the forest was irresistible. Hunters came seeking game, campers came seeking health and recuperation, woodmen came spying out the tall, straight trunks of redwood that would split easy—"shake trees," as they were called, which could be cleft with the ax into long, broad shingles: from stump to branch, a hundred feet or more of "clear stuff" to be packed out on muleback to market.

Later, homesteaders invaded its semi-sacred precincts, mighty men with the ax and the rifle, who for reasons of

their own sought the solitude. There were only few of these intruders, but enough to eradicate in process of time the grizzlies and the cougars, and to make wild cats scarce. Provided as the other animals were with admirable cover and, delivered from the mountain lion, their arch-enemy, the deer and small game became permanent joint tenants with man.

Crude trails were cut to the coast and to the San Lorenzo Valley, and tanbark to some extent was donkey-backed over the ridge to Santa Cruz tanneries.

Thus it is that while we write of this as a virgin forest we do not mean that it has not known man, but that it has not surrendered or been sold to the ravishing, exterminating saw, and retains its woodland integrity.

THE REDWOOD.

By Dr. C. W. Doyle.

Hail, Monarch of the Woods! A thousand years
Have sped since first you reached forth to the sky,
And still your trunk its giant frame uprears,
As though it mocked at time and would not die.
Your roots defy the earthquake's shock, your crest
Denies the puissance of the winter blast;
Year after year your lordly branches dressed
Their phalanxes in green, and still you cast
A mighty shadow 'thwart the tangled glen.
Rooted in majesty for aye you'd stand,
But now your doom is told—lo! pigmy men
Will mar your kingly state with ruthless hand;
The widowed hills and woods will mourn their chief,
And tears distil from every blade and leaf.

—*Surf, August 25, 1894.*

Early History of This Forest.

ORIGINALLY, the redwood forest ran from the Pajaro River to the sand dunes of San Francisco, in an unbroken embankment of evergreen against the westerly slope of the Santa Cruz Mountains. In the middle eighties, the inroads of the lumbermen had become so extensive that the idea of conserving a portion of this forest for posterity found expression through Mr. Ralph S. Smith of Redwood City, editor of the *Times and Gazette*.

It has been said that Mr. Smith's zeal in behalf of a forest reserve was stimulated by the desire of the Spring Valley Water Company to secure a permanent cover for their Pescadero watershed; but be that as it may, Mr. Smith is entitled to the credit of first propagating the idea in print of saving a share of the redwoods for the future. Editor Smith not only advocated it in his own paper, but he obtained a hearing through the San Francisco *Chronicle*, which, under the caption of "A Redwood Park," published the following:

Among the most beautiful of all coniferous trees is the redwood of California, the *Sequoia sempervirens*, as the botanists call it. It is purely indigenous, and with the mammoth *Sequoias* form the distinctive feature of the forests of this State. For many years it has been the chief source of the lumber supply of the State, and in consequence the redwood forests have been enormously depleted. It is known to comparatively few that

within fifty miles of this city, in a southerly direction, there is a redwood forest of one hundred and eighty square miles, or over one hundred and twenty thousand acres. The northern two thirds of this tract is almost virgin, there having been but slight inroads made upon it. This tract begins on Pescadero Creek, forty-six miles from San Francisco. Its western edge reaches to within about four miles of the Pacific Ocean, on an average, and it crosses the summits and covers the slopes of the Coast Range lying between the bay and the ocean.

The forest of which we are speaking is owned by private persons, but it is understood that a portion of it ample for a redwood park, say twenty thousand acres, can be bought at the present time for fifteen dollars an acre, or three hundred thousand dollars for the tract. It is, however, becoming the object of speculation, as redwood lumber is yearly becoming scarcer and more valuable, and if any action is to be taken for its purchase it should be done at once.

It is believed that if the State of California would appropriate a portion of the purchase money, the rest could be raised by subscription from public-spirited men who know and appreciate the value of such a preserve to the State. Its proximity to this city makes it more available and desirable for the purposes of a great forest park than any other body of redwood in the State.

Ralph S. Smith of Redwood City, to whom we are indebted for much of this information, has taken a deep interest in this scheme, and will undertake, if the State will appropriate a reasonably generous sum for the purchase of this tract, to be placed at the disposal of the Forestry Commission, to raise an equal amount by subscription for the same purpose. He has studied the subject carefully and intelligently, and while he is certainly an enthusiast upon it, his enthusiasm should commend itself to all who care for the future of the State.

We can see no good reason why the legislature should not make an appropriation toward the purchase of this tract, pro-

vided the Forestry Commission shall indorse it. They are competent to judge of the desirability of the location for the purpose of a redwood park, and if their report should be favorable, and a perfect title can be secured to the State, we know of no way in which the public money could be better invested, or which would return a better income for all future time. We must not be construed as meaning that the park would pay an annual interest on the investment into the state treasury; but there are other kinds of income besides interest. Golden Gate Park is not a paying institution in the ordinary acceptation of the term, but it would be hard to convince a San Franciscan that the city has ever invested any money to better purpose than there. Yosemite, Yellowstone Park, Niagara—none of them pay money dividends, yet each is worth untold wealth to the nation.

We cannot measure everything by the decimal notation, nor figure a percentage of money gain upon every investment of wealth. When redwood lumber becomes scarce and valuable, the esthetic point of view will not commend itself to those who have or can obtain control of this body of redwood, and the dollars will weigh heavier with them than the beauty or pride of the State. They will not care to preserve timber having an actual cash value, in order that future generations may enjoy a redwood forest. It would be too much to ask of private individuals to sacrifice material interests for an abstract proposition.

The *Chronicle* article, viewed in the light of subsequent events, was both prophetic and pathetic.

Needless to say, the State did not acquire twenty thousand acres at fifteen dollars per acre. Fifteen years later, the State bought a bargain when it obtained solid redwood timber land at one hundred dollars per acre.

The reserve in the mind of Mr. Smith extended over the Pescadero and the Butano, instead of the Big Basin.

A Redwood Park was not heard from again until 1889. In the mean time, Ralph Smith and his plans had both passed away. At this time, a portion of the lands now included in the State Redwood Park, a tract of 1,300 acres, was projected as a game preserve.

Ferdinand Lee Clark, who had an eventful and distinguished career in military and civil life, was in Santa Cruz at that time, and sought solace and escape from the world in camp life in this spot. Mr. Clark wrote for the Santa Cruz *Surf* an article describing the operations then instituted, in which he said:

> The region in and about the Big Basin is the wildest and roughest that can be conceived, the slopes being rugged and the level plateau covered so densely with underbrush as to be almost impenetrable.

The operations then in progress he describes as an intent to fence the tract of 1,300 acres, for which purpose 2,500 pickets were to be split. A space twenty feet in width was to be cleared along the line of the fence.

> All the underbrush on the plateau of Waddell Creek of 300 or 400 acres will be cleared away and a great redwood park will be opened. Fourteen men are now clearing for a road. It is expected the place will be swarming with hunters and fishers.

Owing to some manipulation of land titles, this work fortunately was soon suspended. (Some of the pickets then split lie on the floor of the park, still sound, in 1912.)

Mr. Clark also wrote of "an immense redwood tree of great height and 28 feet in diameter." (Now called the Father of the Forest.)

Photo by Streator.

Father of the Forest.

His personal letters were so enthusiastic that the writer determined to take the trip. It required three times as many hours to reach the edge of the Basin from Santa Cruz as it does now to "run down" in an auto from San Francisco to the Governor's Camp in the heart of the park. The twilight was deepening when the writer and a companion prepared to tarry for the night at an abandoned tanbark camp, utilizing the donkey mangers for mattresses.

The writer slept that night—nay, he slept not but lay looking upward, following the faint lines of light that traced the trunks of the redwoods, until they touched the stars. An optical illusion, perhaps, but not a delusion. Jacob's ladder was no more a myth or a miracle, for verily the redwood tips were in contact with the heavens.

The things heard in the stupendous silence of that night, the things seen in its impenetrable darkness, were unutterable, but the slogan "Save the Redwoods" was seared into his soul.

Primal Appearance.

In the morning we followed the bark haulers' trail to Captain Clark's camp, where two days were given to genuine exploration. During these days we often shared with Captain Clark the joys of discovery, looking for the first time upon curious creations, marvelous growths, and exquisite manifestations of woodland beauty hitherto unseen by mortal eyes.

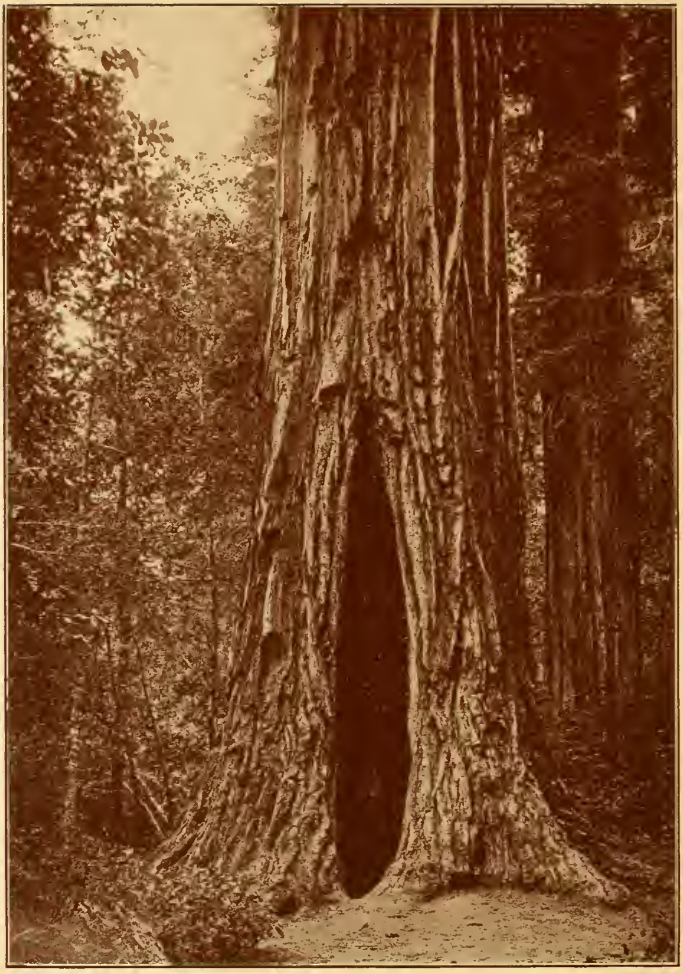
Sight-seeing was a constant battle with the underbrush,

fighting our way step by step, often crawling on hands and knees, and sometimes compelled to adopt a more prostrate position, as was the serpent of Eden.

But the rewards! One by one we traced out the big trees since become famous for their size, for their height, some for their symmetry and timber-producing capacities, some for their wonderful triumphs over fire, some for quaint growths of burl, some for their strange contortions, but all challenging admiration and giving forth an impression of life and power beyond transmission in speech —beyond conception by careless beholders. We stood dumb before a mammoth redwood stump fifty feet high, the basic terminal of a tree, which some time had been riven by an unknown force. Its sundered halves lay stretched prone on the earth for more than two hundred feet, embalmed in moss, through time so long measured that on the top of the stump, out of the air had been gathered soil and sustenance sufficient to support a thrifty young fir tree several feet in height.

We felt a strange thrill when standing in the presence, and in the interior, of that phenomenal redwood which has come to be called the Mother Tree. Resisting alike the stern hand of Time and the deep fires of affliction, she still abides serenely, green at the top, while succeeding generations of other trees have sprouted, grown, matured, decayed about her.

Not in the depths of the Grand Canyon, nor from the summit of any mountain, did we ever experience such a sense of sublime awe, as when through the thicket, we



Mother of the Forest.

came into the presence of those four redwoods, now known as the Calendar group. Four trees, straight as arrows, symmetrically seamed, rising more than two hundred feet into the heavens, of exactly equal size, standing an equi-distance apart, directly upon the points of the compass, north, east, south and west. To this day there is a mystery about these trees that refuses to resolve itself into the commonplace.

But the mornings—and the same mornings dawn here forever, past, present and future. Oh, the dawning of the mornings! When the light so softly, gently, so sweetly persuasive, so tenderly penetrates the night, stealing upon the sleeper in the open like a fairy's touch upon the eyelids. You must awake, for you are about to witness a miracle as old as creation, as fresh as the morning dew.

Soon you can see "trees as men walking," and witness a movement in the forest which has stirred all animal life and set millions of leaves a quiver.

Oh! the melody (if we may use the word) of this filtered light which comes down through the tree tops, diffused, rarefied light, the Divine light that made the morning stars sing for joy on creation's dawn.

In was our leaving day, but before breakfast there was to be a visit to a fallen tree in the bosom of Opal Creek, from whose upturned stump three lusty redwoods had grown, standing in exact line with each other, with their foothold embanked in moss and ferns. It was a "fierce" brush fight to reach the spot, but then the wonder and the beauty, the suggestiveness and the sublimity of the scene,

Photo by Applyby.

Growing Trees on Upturned Stump.

absorbed every sense. Tiger lilies, taller than any man, with blooms of flaring fire stood by the side of the prostrate body of this past potentate of the forest; swaying, overhanging incense-breathing azaleas hid the stream, and just as the first rays of the sun touched the upper branches of the surrounding trees, a thrush, perched high on an oak, poured into the arboreal silence a libation of praise that vocalized the very soul of the forest.

These trees have since become known as the Crucifixion group.

When we went forth into the world again, no man believed our report, and as for preserving redwoods, the timber-cutting population of that period looked at us with the same contemptuous pity that they would if we had proposed to conserve the waters of the Bay of Monterey.

Nevertheless, within twelve years, the State invested a quarter of a million dollars in this forest, to the honor and credit of its legislators, and the ultimate blessing of mankind.

Early Explorers.

During that year several articles were published in the San Francisco *Chronicle*, the San Jose *Mercury* and other State papers, emanating from Captain Clark and others, all giving favorable consideration to the project of preserving a "Redwood Park of the Pacific." Editorially the *Chronicle* gave emphatic endorsement to the plan, and of the work of publicity carried on at that time said:

F. L. Clark, whose interesting accounts of the Santa Cruz Big

Trees have lately been published in the *Chronicle,* has been exploring the recesses of the Big Basin, a grand area of mountain land lying in San Mateo and Santa Cruz counties, taking the elevation of the prominent ridges and mapping out the intricate system of streams that have their rise in that region. Mr. Clark has entered the basin from different directions, obtaining information by actual observation of value to those interested in the topography of the country, and aiding materially in the correction or confirmation of surveys made. This work is in the line of that undertaken by the late Ralph Smith, who, as editor of the Redwood City *Gazette,* was untiring in his efforts to secure as a national park some portion of the great groves of redwood that are now rapidly disappearing before the ax of the woodcutter.

Captain Clark traced the headwaters of the Pescadero, the Butano, the Waddell, the Gazos, Boulder Creek, and the San Lorenzo, and the elevations and directions he gave have been confirmed by the Government surveys since made. His last article ended with these words:

All this great triangle is one vast forest of noble redwoods interspersed with groves of oak and many kinds of pines, with a dense undergrowth of smaller trees and shrubs.

He was solicited to prepare a paper on the *Sequoia sempervirens* to be read before the State Horticultural Society at its meeting in Santa Cruz in 1891. This paper was afterward published in *Wood and Iron,* and portions of it obtained a well-merited circulation in the State press.

His appreciation of the redwood is attested by the following extract:

Nowhere throughout the world can be found trees more majestic—inspiring! There is a grand symmetry in their growth

quite distinct from the sturdy habit of the ancient oaks of Europe, the towering grace of Australia's eucalyti, the pillared shade of the banyan trees of India, or the dome-like, sepulchral forms of the great African baobabs, all of which have excited the admiration—yes, the worship—of man from remote ages.

Involuntarily we associate the Sequoias in antiquity with the Pyramids; and while wandering amidst their massive growths one half expects to find there the ruins of fanes and temples as ancient as those on the banks of the Nile, or the quaintly sculptured monuments of the Toltec and Aztec races, lying half buried in the dense forests of Chiapas and Yucatan.

When these great trees were seedlings—the Egyptian Pyramids were fresh from the builders' hands—the foundation stones of those of South America were not yet laid.

In those dim, distant days the very LAND from which they sprang was—geologists affirm—yet newly upheaved from the ocean depths. The rugged range of the Sierras, on whose western slopes the *Sequoia gigantea* is only found, looked down upon the broad, shallow lake covering the valleys of the San Joaquin and Sacramento; while on the Coast Range hills the delicate foliage of the *sempervirens*—our own "redwoods"—began to tinge with ever-living green the otherwise bare elevations.

In the growth of these great trees one feels there is a tremendous vitality that time cannot weaken—that the passing centuries seem but to renew. They are prostrated by violent storms, by earthquakes, by the ax of the woodman; here and there they are undermined by floods or eaten out by oft-recurring fires, but though, in the latter case, they may be reduced to mere shells, though we may stand within the lofty shaft and gaze upward through the hollow column's blackened heart two hundred feet and see the nearby clouds drift by, yet the trunk sends out a vigorous growth of branch and leaf and fruit; the shell is still "sempervirens."

"Save the Redwoods."

ALTHOUGH much sentiment was aroused at this time for the salvation of "some redwoods somewhere," yet the movement lacked political or commercial leadership, and lapsed into a waiting mood.

The decade that followed was one of education and evolution along lines of forestry and conservation. The hope of a redwood reserve in the Big Basin was never abandoned, and its advocates often secured a hearing in the public prints. The value of such a reservation had been presented to the late Senator Stanford in so convincing a light that he had determined to secure several thousand acres in this region and annex it to the university he had founded, his death preventing the consummation of his plans. Meantime, Dr. W. R. Dudley, head of the botanical department of Stanford University, made diligent research into the vegetable life here manifest, finding a variety of trees, plants and shrubs, indicating this as a transitional zone for northern and southern trees of the Pacific coast.

On March 17, 1900, a double-column, double-leaded editorial appeared in the Santa Cruz *Surf*, in which, among other things, was stated:

> All lovers of Nature, every person who appreciates the majesty of a tree, every individual whose hopes and aspirations extend into the future, must rejoice in the action of Congress designed to avert the destruction of the famous Big Trees of Calaveras.

Photo by Streator

The Cloistered Aisle.

John Muir says: "Every *Sequoia,* I fancy, has heard the good news and is waving its branches for joy."

And if these inanimate personalities, so to speak, are waving for joy, it must be not only because the ax is stayed from the *gigantea,* but that there is an assurance that somewhere a remnant of the sempervirens will also be spared from the assaults of the lumberman.

With the impending revival of the lumber business, and the prospective demands for export, the forests will become extinct, long before California celebrates the centennial of American occupation.

The present appears an opportune time for the revival of the agitation instigated some years ago in behalf of a redwood preserve.

Indeed, it is a case of now or never with the Big Basin, the last possible reservation of redwoods which shall not only include big trees, but the varied growth of a typical California forest.

Its peculiar topography and distance from transportation preserved the tract in question from the early onslaughts upon the redwoods, and here within forty miles of San Francisco, as the bird flies, is a bit of forest as pristine as "the perfect world by Adam trod," and whose trees cast broad shadows before Rome was built.

A pamphlet could easily be written descriptive of Nature's manifestations in this peculiarly favored spot. This article can only hint, and suggest, and it must suffice to say that altogether there are over fifty varieties of tree growth within an area of six miles square, including many noble specimens of the redwood, fir, madrone, oak, pine, maple, etc.

Its wealth of fauna and flora is distributed in a way that would delight the soul of a landscape gardener, for within the confines of the "Basin" is constant variation of aspect and altitude.

As it stands to-day the preservation of the Big Basin appears to be "Nobody's business." The timber cutters commenced

encroaching on its limits last year. This summer they will do more mischief, and in two years, the region instead of possessing Edenic aspects, will be worse than a Sahara.

It was easy to stay the hand of the destroyer in the Calaveras Grove, when the women of the California Club took up the matter.

Perhaps there is work here and now for women to do.

Certainly the value of the Big Basin undisturbed to Californians and the world, now and in the future, as compared with the Calaveras Grove is as 16 to 1.

Strangely enough, in a way unperceived, these latter words were prophetic. Within two months an organization had been formed, largely through the efforts of women, and including in its membership some of the most brilliant and energetic women of the State, who aroused, stimulated and rewarded, by their approbation, the men who made the ultimate fight to "Save the Redwoods." The list included Mrs. Josephine Clifford McCracken, Mrs. Carrie Stevens Walter, Mrs. Stephen A. Jones, Mrs. A. T. Hermann, Mrs. Lovell White, and many others.

During the interval extending over two years before the final acquisition by the State of the lands embraced in the present bounds of the redwood park, the necessary expenses of the crusade, amounting to several thousand dollars, were furnished by a woman, a woman whose name will ever be written high in the annals of California—Mrs. Phoebe A. Hearst!

Mr. Andrew P. Hill, of San Jose, an artist of high repute in this State, had ever been an admirer of the redwoods, and as early as 1877 had painted the group that

stands near the Hotel de Redwood in the Santa Cruz Mountains.

At the time of which we write, Mr. Hill had been commissioned by a London magazine to secure some photographs of the Santa Cruz redwoods. He came to the Fremont Big Tree Grove near Santa Cruz, but the owners of the property forbade him to photograph the trees.

Much incensed by their action, the artist began to think, and the more he thought the more the conviction came to him that these trees, being natural wonders, ought to belong to the people. Going home on the train that day he wrote to Josephine Clifford McCracken of his opinions and conclusions. He wrote other letters, among them one to the Santa Cruz Board of Trade, imploring that body to "pass a resolution recommending that Congress be petitioned to make the purchase of the Fremont Grove."

The Secretary replied to Mr. Hill, calling his attention to the Big Basin forest and adding:

> As your enthusiasm is for the smaller proposition, so in ratio will it increase for the larger.

And so it did.

Mr. Hill in writing to the San Jose *Mercury* of this time said:

> The Chamber of Commerce of San Jose quickly followed. A large meeting was arranged to be held at Stanford University and it was found that Dr. Dudley had already examined the Big Basin with Professor Wing, had mapped it, wanted it preserved,

and was just waiting for the lively, go-ahead enthusiasm of some of the members of the Sempervirens Club. Subsequently a splendid meeting was held and it was arranged to make a trip to the Big Basin to examine the new wonderland.

On the 16th of May, 1900, Mr. Hill's party reached the town of Boulder Creek. Of this date Carrie Stevens Walter of the committee from San Jose, wrote as follows:

Our party from San Jose were received at Boulder Creek last evening by the Santa Cruz committee and entertained most hospitably. We leave early this morning for the mysterious goal of our ambition—the Big Basin.

The Mountain *Echo* of May 26, 1900, contained this item:

THE SEMPERVIRENS CLUB.

The visiting party in the Big Basin last week held an enthusiastic meeting the night before breaking camp and formed an organization to be known as the Sempervirens Club. The object of the club is to work for the preservation of the Big Basin and adjacent region as a public park. After viewing and exploring in every direction for several days the members of the party were so impressed with the beauties of the country and the necessity for the preservation of the remaining Sequoias that they felt no time and place could be more appropriate to organize for the effort than right in the heart of the Basin itself, there and then. Thus was the Sempervirens Club of California organized at the foot of Slippery Rock, just across the stream now called Sempervirens Creek, and the place was named Sempervirens Camp.

The zeal and enthusiasm of this club knew no bounds, and it compelled the attention of the State. In a few months it attained a large membership.

First Impressions.

N THE summer of 1901 a large party of Sempervirens people camped in the basin within the present limits of the park. Of their experiences W. W. Richards wrote:

For five days we made trips throughout that portion of the Big Basin which was accessible by trails, kept open by the deer and other animals. The size and grandeur of the thousands of immense trees that were seen will become world wonders in the future. Their immense height—300 to 350 feet—diminishes their huge bulk to look at, yet there were hundreds of these forest giants, each of which, a score of people surrounding, could barely compass. One stalwart redwood has a partly burned-out opening in its trunk, about twelve feet in diameter and running up to a roof, twenty-five feet from the ground, in which could be seated a large party of people. Four immense trees standing as on four corners, were of ponderous growth, their graceful tops seemingly piercing into the very sky. Beneath their shade the ground is fairly ablaze with beautifully-hued forest flowers, creeping violets, wild sweet peas, wood buttercups, and evening primroses. The glades were garlanded with delicate harebells and tiger lilies and carpeted with tiny ferns, interlaced with sweet-smelling verbena vines. Inviting patches of wild strawberries furnished a feast. This sight of nature's bounty, spread broadcast, might well gladden the hearts of millions of human beings in times to come, who, escaping from the clash and turmoil of a greater San Francisco, seek the enjoyment, the invigoration, the elevation and refinement of this glorious heritage handed down to us through the centuries.

Mrs. Stephen A. Jones, of San Jose, was another of the appreciative campers at this time, as the following will show:

I like to think that this trail has been made, not for utility but for beauty; that the few people who walk over it come to worship amid the cathedral aisles, to bare their heads and bow their hearts before the sacred influences of the primeval forest. All around you giant redwoods rear their stately columns, mingled with firs "fit for the mast of some great admiral." The wind sighs softly through their lofty branches, but lower down not a zephyr is stirring. A solemn stillness pervades the place, broken only now and then by the far-off note of a bird. The sunshine falls in filtered brightness, and flecks with gold the green gloom of the place.

Into this sanctuary the common thoughts and petty cares of daily life dare not intrude; here is peace, serene and perfect rest.

In this vast laboratory nature distills a balm for our hurts, a subtle essence that heals and soothes; and as we breathe the freshness and fragrance of the air we receive also strength and hope from some divine and hidden source. The things of time and sense lose their power over us; spiritual influences are supreme in these hallowed precincts. The fetters of custom and conventionality fall away; we taste soul freedom and feel intimations of immortality.

In every natural forest there broods something of this magic spell, this power to elevate the soul and nourish it with holy thoughts, but, perhaps, none others possess it to quite the same extent as the redwoods. A sense of their hoary antiquity impresses the beholder and makes him realize the brief span of his earthly existence.

The winds of untold centuries have sighed through their lofty crowns; all of modern and much of ancient history has transpired since they first reared their heads above the mold. Nations have

risen, flourished and passed away; dynasties of kings have gone down into the dust; the sands of deserts have blown over forgotten cities; conquerors and conquered have been whelmed in one common oblivion. Vast changes have taken place in the natural world; rivers have left their old, and worn for themselves new, beds; the sea has made more islands, cutting off promontories from the mainland; harbors have been filled up with sand by the tides, so that what were once seaports are now inland cities; volcanoes have built up fresh cones or washed away ancient ramparts in a molten flood.

But under perfect condition of soil and climate our *Sequoia sempervirens* have lived and flourished. Succeeding centuries have seen them more deeply rooted in the ground, and with loftier heads. Storms have not harmed them; strongly buttressed as they are, they defy the fiercest wind that blows. Decay nor age does not blight them; they seem to have no life limit. Even the fires, caused by lightning or some other agency, which ran through the forest centuries ago, only hollowed their trunks or blackened their bark, leaving them still green and vigorous.

Edwin Sidney Williams, of Saratoga, another ever-faithful friend, wrote at this time:

But the chief reason for my growing interest in Sempervirens Park is its beneficial effect on the people of the State, particularly the working people of the bay cities.

There are labor's hosts, "chained to the oar of labor," for whom a costly vacation is an impossibility. It goes to my heart's depth as a patriot and a Californian that even a wild boy from San Francisco's Barbary Coast may come down afoot with his blankets on his back, and if only he obeys the directions of the firm and kind warden, he may be as secure in his nest in or under a great tree as is the Governor himself in "the governor's camp." The captain of "the boys' brigade" may bring his whole

company down and find abundant room. "Campers keep out" may greet him on the road, but when the warden takes him in, the czar of all the Russias cannot put him and his squad out so long as they obey rules.

It's the true democracy of the park which charms me, and in working for it, though the least of the workers, I am working for the better California. No street arab will go back from the grandeur and the beauty of these primeval forests untouched. The higher influences of American life will have a better chance at him if he senses what the State has done in appointing him one of the guardians of God's great trees. And the poor sewing girls can come at slight expense and need no other chaperon than the gracious matron in the park.

In those days the pen of Josephine Clifford McCracken was busy and found expression through the daily newspapers, in *Out West*, *Western Field* and the *Overland Monthly*, in articles largely argumentative and appealing to public interest. Her own impressions of the great forest in its primal period were expounded in an article in the *Western Field*, on the occasion of a visit when Hugo de Vreis, the Dutch savant, was a guest of honor.

It is a remarkable truth that the beauty of "the way" has intensified with the passing years, and the language of the trees, grown more and more intelligible to human ears. A part of Mrs. McCracken's account of the visit deserves to become historical. From it we quote:

Even those among us who were far-traveled and world wanderers, found something to admire and marvel at here, for far as the eye could reach there was grandeur and sublimity. To the right, the crumbling walls of the castellated cliffs, crowned at

the pinnacle with the decayed glory of broken turrets, yawning casements and half-fallen colonnades, with the dark green trees above, and the brighter green of the brush growing out of the clefts below might well have been the remnants of castle park.

In swinging trot the horses passed through miles of this picturesque country; then the ascent grew steeper. An abyss, it seemed to me, opened below us; the chasm was a wide, broken valley, bounded by a chain of mountains, bold, green clad and topped with redwood trees, single and in masses. When these receded and left an opening toward the sea, the sunny haze made filmy veils to waver and wane in the uncertain distance.

Then we reached the summit; and if the dizzy heights and green depths of the past mile or two had been greeted with cheers and exclamations, the level stretch before us now was no less fervidly admired.

And now we have come to the line of the park. The redwoods stand thicker here; the lower growth and underbrush is heavier and when the road comes nearer to the winding stream, we see enormous shrubs of white blooming azaleas, clusters of fiery lilies and still closer in the densest shade of rock and bush, great clumps of the five-finger fern. The horses' feet fall noiseless on the smooth road; the tinkle of the swift running stream, the subdued rush of the water where it falls over rocks and ledges, the song of the breeze in the tall trees above, cadences forever swelling and forever falling, the endless lullaby that Nature sings to weary heart and fretted spirit—how like a breath from heaven all this falls upon us, the peace be still that is spoken to all who come to rest beneath the canopy of these everlasting trees.

We pass Sempervirens Camp and Slippery Rock, that spot dear to my heart. A slowly-rising amphitheater is this rock floor, with stiff, straight redwoods at the back, and side-screens of firs and madrone, chestnut oaks and young black oaks, with willows swaying here and there. At last we are in the heart of the Big

Basin, where the giant redwoods are awe-inspiring and overwhelming. Tape measure and camera are in constant demand; discoveries of strange plant growth, of flower and shrub, of beautiful forest vistas, were so frequently made that time and distance seemed annihilated.

THE SEQUOIA.

By Dr. C. W. Doyle.

See where it stands in undiminished splendor,
The giant sentinel of Pan's retreat ;
Man doffs before it humbly, fain to render
Homage, and lay due reverence at its feet.
No airy spire, no soaring dome tremendous,
Declares God's glory like this tree stupendous.

Man's labors vanish ; temple, palace tumble ;
And bronze, and marble tarnish and decay ;
The greatest monuments e'er reared shall crumble,
Ere this proud tree shall bend before Time's sway.
The rosy morn its royal crest can greet,
While darkness spreads her couch about its feet.

The fairy myths of Greece that figured Naiad,
Housed airy Echo, gave the stars a name,
Apportioned to each Oak its proper Dryad,
Could find for this no genius of like fame ;
God's angels, Gabriel, Abdiel, and their kin,
Alone might dwell such noble fanes within.

Father Kenna's Account.

THE honored president of Santa Clara College, Rev. Father Robert E. Kenna, S. J., was one of the original members of the Sempervirens Club, and a member of the first park commission, appointed by Governor Gage, and also a member of the commission appointed by Governor Johnson.

Father Kenna, for the *Bee* of Sacramento, wrote a history of the movement to acquire this park. It is in the words of one having authority to speak in the matter, and clearly and accurately bridges the space between agitation and acquirement of this transcendent forest as the people's playground. Somewhat abridged it here follows:

The happy inspiration of an editor to save the redwoods of the Big Basin from the ax of the woodchopper and the saw of the lumberman became, when published, a mighty, living force through the Sempervirens Club of San Jose, and resulted in securing to the State, and it is hoped, to posterity, a great park of primeval redwood trees.

* * *

No sooner was the club formed than an enthusiastic army of supporters was at its back, ready to come to its aid, as it did come, in the moment of danger and threatened defeat. The brigades of this little army were drawn from Native Sons and Native Daughters of California, from the Pioneers and other organized bodies and besides many patriotic ladies and gentlemen

throughout the State, and the majority of the press freely advocated the noble cause. But the real, living force working with and through the club came from the universities of Stanford and California and the college of Santa Clara.

The club's first move was to send an energetic delegation of ladies and gentlemen to Sacramento in 1901 to interview the Governor, and to interest the legislators in passing a bill to save the trees in this basin from destruction. The result of this first move was very encouraging to the club, and a bill was drafted and presented to the Assembly, empowering the State to spend two hundred fifty thousand dollars to purchase two thousand five hundred acres in the Big Basin, and to appoint four commissioners, who, with the Governor as ex officio chairman, were to purchase, control and govern the lands thus secured to the State and the California Redwood Park.

The task of securing the passage of this bill was left with A. P. Hill, who was the right man for the difficult and delicate work. One of the very first movers in the glorious work, full of honest enthusiasm, true as steel, loyal and honest, unselfish and self-sacrificing, his one object was to secure an honest, effective measure to save and to protect those magnificent redwoods. The dear, noble fellow with his wonderful enthusiasm and incorruptible honesty, and open, above-board talk, was an enigma to many old political lobbyists who tried to block his work. Nothing disheartened him, nothing made him retreat until the object of his heart was secured in the passage of that bill to save the redwood trees.

The politicians smiled at his simple candor. He was advised to go home, for there was no hope for the passage of his pet bill. Several times in the heat of the fight he called the writer to aid him, when what seemed impossibilities were demanded.

Two speeches were made in support of the bill, the first a

magnificent oration by Mr. Delmas, worthy both of the subject and of the matchless orator. At the request of the club, I asked Mr. Delmas to speak for the preservation of the redwoods. He consented very graciously. The second speech, if I may so characterize the remarks made by the writer, was given in answer to an earnest appeal of Mr. Hill in one of the dark moments of his work for the bill.

My remarks, though very simple, were given with an earnestness that made the Senators accept them as the sentiments of my heart. I said in part: Senators, I do not come to speak to you as a priest, nor as the president of a great college, nor in the language of such, but as a "forty-niner," and in the language of one who loves the great land of the West, and her magnificent forests which so often charmed my boyhood days and thrilled my young heart with high and noble aspirations. They spoke to me of Liberty, and they filled the mind with great thoughts and the soul with lofty aspirations. These redwoods are preeminently Californian, unique in their species and situation, and as a forty-niner I beg you to stay the hand that would harm those that still remain to recall the glories of those vast virgin forests now no more.

I alluded quietly to the efforts, hidden and ignoble and unjust, to defeat the work of the Sempervirens Club. The Senate received my homely remarks graciously, and believed me, and when the bill came up finally there were only three votes against it. It was a great triumph; the passage of this bill was indeed an honor to the legislature of 1901.

The great object of the club and the men and women behind the club was threefold:

1. To save the trees for posterity.

2. To save the trees for scientific study and also the many species of fauna in the basin.

3. Last and by no means the least important was to save the basin and its trees to form a great park for the people for holiday

outings; to prepare a place whither our children and workmen, factory girls and others breathing all the week impure air, might, amidst the great trees and along rippling brooks, breathe pure air and rest amidst those great forests, where their minds and hearts are lifted to higher, purer, nobler things.

Men and Trees.

IT has been calculated that a single tree is able through its leaves to purify the air from the carbonic acid arising from the perspiration of a considerable number of men, perhaps a dozen or even more.

The volume of carbonic acid exhaled by a human being in the course of twenty-four hours is put at about 100 gallons; but by Boussingault's estimate, a single square yard of leaf-surface, counting both the upper and the under sides of the leaves, can, under favorable circumstances, decompose at least a gallon of carbonic acid in a day. One hundred square yards of leaf-surface then would suffice to keep the air pure for one man, but the leaves of a tree of moderate size present a surface of many hundred square yards.

Purchase of the Park.

PASSAGE of an enabling act, and the securing of an appropriation, did not "save the red woods" or establish a permanent forest park—at once. Governor Gage appointed as members of the California Redwood Park Commission, Wm. H. Mills, the land agent of the Southern Pacific Railroad Company; A. W. Foster, the president of the Northwestern Railway and a regent of the State University; Father Robert E. Kenna, S. J., president of Santa Clara Collega, and Dr. Wm. R. Dudley, head of the Department of Botany in Stanford University. The Governor himself was an ex officio member.

It became their duty to investigate, bargain for and buy the best and most for the money, two hundred fifty thousand dollars. They made haste slowly in their task, and when it became generally known that the heavily timbered lands in the Basin were held at one hundred dollars per acre, there was much opposition manifested. It seemed so short a time before when the entire area of the Basin might have been purchased for a less price, that the lumbermen's figures were denounced as a hold-up.

But finally three things were demonstrated.

First, that the amount of standing timber was much larger than had been realized.

Second, that increased accessibility and improvements in milling operations had enhanced their value.

Third, that the lands in question were really cheap at the prices offered.

Mr. I. T. Bloom, owner of three hundred twenty acres within the edge of the Big Basin, had bonded his holdings for the State at one hundred dollars per acre, but when the option expired, he refused to renew it and proceeded to cut the timber.

After the felling operations were over and before milling began, a representative of the Santa Cruz *Surf,* with an expert lumberman, went over this tract, selecting here an acre and there an acre, counted and measured and scaled the fallen logs, and proved beyond question that the Bloom lands would yield in lumber far more than the figures at which similar lands were offered to the State.

Other investigations were made by expert cruisers of the standing timber in the present park area. Perhaps the most convincing of these was by Mr. J. W. Peery of Boulder Creek, a lumberman of long experience, and a man of a reputation that commanded confidence.

We append a part of Mr. Peery's report, as it deserves a place in park history:

We selected five acres out of the northwest quarter of the northwest quarter of section 8 of township 9 south and 3 west as a comparative 5-acre lot as an average of the main body of the whole, and estimated the timber on said 5-acre lot. We found that it contained 168 trees of various dimensions aggregating

712,863 feet, board measure computation, making 142,572 feet per acre. We also selected 5 acres as a compared, 5 acres of the poorest 40-acre lot in the southeast quarter of section 7 of township 9 south of 3 west. We found on this 5-acre lot 103 trees; we estimated these 103 trees to contain 316,272 feet of lumber, board measure, or 63,254 feet per acre. These two 5-acre lots we had surveyed by County Surveyor Ed Perry, the lines brushed out so as to be plainly defined. Now adding these two 5-acre lots together, we find 1,029,135 feet, board measure, on the two 5-acre lots. This 1,029,135 divided by 10, as it was 10 acres, make 102,913 feet board measure timber per acre.

We deducted 250 acres, 10 per cent of 2,500 acres from the whole as waste land, leaving 2,250 acres containing an average of 102,913 feet per acre, aggregating the amount of 231,563,250 feet of timber board measure. We also estimated 5 acres on what is known as the Tom Maddock place. This place was selected by Mr. Maddock and others, and at their request we estimated the amount of timber it contained. This 5-acre lot contained, as per our estimate, 1,124,419 feet of timber. This exceeded our best selected 5 acres 411,556, and I am convinced that ours is a low estimate.

It may be added, in parentheses, that an acre lying easterly across the roadway from the Governor's Camp is estimated to contain half a million feet of standing redwood. These estimates relate solely to milling lumber and do not include the oak, madrone, fir, pine, alder, maple and other woods.

To many readers these mere figures will be meaningless. To partially translate them, it may be stated that the amount of lumber mentioned would much more than

suffice to build a city the size of San Jose, and that it would require to transport it to market 19,280 cars.

Governor's Camp.

During the progress of these negotiations, it was deemed advisable to bring Governor Gage and other members of the Commission, with some lumber experts, into the forest for a few days of personal examination.

To provide accommodations, lumber for a five-room cabin and a cook house was packed on muleback over a trail two and one half miles beyond the terminus of team travel at that time.

This was the last year of the administration of Governor Gage. The following year, after the purchase of the park lands had been completed, and J. H. B. Pilkington appointed warden, Governor George C. Pardee and family occupied this camp for several weeks. In the mean time, after the real estate transfer was completed, Father Kenna resigned from the Commission and Henry F. Kron of Santa Cruz was appointed in his stead.

It was while Governor Pardee and family were at the camp that a notable "surprise party" was planned, Governor West of Utah, then visiting in Santa Cruz, being the guest of honor. Thus it was that three governors were entertained at this camp prior to the opening of the park to the public, and the name of Governor's Camp became attached to the principal stopping place in the confines of the forest.

A majority of the mammoth trees are clustered within easy walking distance of this camp. There is an open glade that gives a space of clear sunshine and green grass, and it borders Opal Creek at a very picturesque portion of the stream.

Distances and directions in and about the park have the Governor's Camp as the focal point.

IN THE REDWOODS.

By A. D. Nordhoff.

As in some vast cathedral, one looks up
Through columns, carved and tinted deep by time,
Up, up to where the light grows faint; and where
Through windows, made by dust of ages dim
A few pale sunbeams strive to force their way;
So in the redwoods. Midst the columns vast
Of nature's great cathedral, gazing up
One finds the same dim distance and the same
Pale sunbeam and the same dim, far-off light;
But in the place of windows, filmed by time,
Great interlacing branches, tier on tier,
Set in a frame-work of the fern-like leaf;
And in between, faint glimpses of deep blue,
As if some master-hand, with earnest touch,
Had painted every space, 'twixt leaf and branch,
With tender color, like heaven's own.

From the very beginning both the *Sequoia gigantea* and the *Sequoia sempervirens* grow very slowly and yet very steadily upward. The Cedar of Lebanon, though it may reach a very great age, has however in its youth a growth so rapid as to fit it in a few years for many purposes of cabinet or ornamental work. The glory of the *Sequoia* is in its stately trunk, but the glory of the cedar is in its magnificent foliage.

The Tract Acquired.

BARGAINING, and some bickering, came to an end in the transfer of 3,800 acres to the State for the consideration of $250,000. The way the lumber companies who owned the land figured it was that they had sold 2,500 acres of timber at $100 per acre and "thrown in" the other 1,300 acres, about 800 acres of which was chaparral, and about 500 acres cut over, or burned over, but capable of reforesting.

This tract, which by purchase became Sempervirens Park, officially known as California Redwood Park, embraces the heart of the Big Basin.

It was regarded at the time not as containing the ultimate extent of the Redwood Forest Park of California, but merely as the nucleus of the park of the future.

The holding of these lands checked the progress of the sawmill, pending the time when an educated and enlightened public opinion would reach the point where it could grasp the importance of acquiring the entire Big Basin area for a permanent wildwood for posterity.

Present park limits cover the source and course of the several small streams that converge to form Waddell Creek, emptying into the ocean midway between Pescadero and Santa Cruz. The line extends on the north to the ridge that marks the boundary between Santa Cruz and San Mateo counties, at an altitude of 2,390 feet. The main plateau which lies along Opal Creek, from the

Governor's Camp, has an elevation of 1,000 feet. At the southerly line of the park where Berry Creek has its confluence with the west fork of the Waddell, the elevation is 500 feet. These figures make clear the statement that the park is angular—and these angles will often reach 45 degrees.

To this diversity of elevation and aspect is due the varied forest growths here found, which constitute much of the charm of the forest to the visitor. The changing scene is a constant stimulus to take a tramp, and a continuous reward for so doing.

On the lower levels we find dense shade at midday, a soft, deliciously damp atmosphere in which ferns and mosses thrive perennially, covering the nakedness of the rocks, throwing a pall of living green over the prostrate forms of the fallen forest monarchs.

Trees tower for two hundred feet—and more—their roots rejoicing in the percolation from living waters, their topmost twigs catching the sunshine above the canyon depths.

Out and up lie the sandstone slopes, semi-arid, scantily covered with chaparral, swathed in sunshine, swept by the winds, beaten by the storms of winter.

Although not originally included in the scheme to "save the redwoods" these chaparral lands are by no means the least attractive portions of this wonderful reserve. Following a trail one scarcely perceives when the giant redwood forest begins to recede until he is far among stunted growths surrounded by a new low vegeta-

tion, in an elfin wood, feeling the invisible presence of other tree spirits; a different race from those who abide under the shadow of the *Sequoias*. As you look about you observe that the pines and the oaks have lost their majesty and are struggling for a livelihood, putting on thicker leaves and a tighter, stronger bark. The tan oaks have disappeared altogether, and only small live oaks and the most persistent scrub oaks are seen. The pines lower until they are not more than ten feet tall. The madrone gradually gives way to the manzanita, and unless the trail is well cleared, the buckthorn, greasewood and yerba santa will dispute the path.

Californians affect to despise the chaparral, but to the Easterner it is a new curious wonder. The name was given to us by our Spanish-Mexican affiliations, and signifies diminutive evergreen forest, which is neither timberland nor woodland, nor yet brushland, simply chaparral.

The most interesting growths in this miniature of a forest are the manzanita, the mountain mahogany, and the toyon or Christmas berry. In each of these there is such a combination of strength and beauty as to attract the attention of the casual stroller, while to the true student they are a never-ending impulse to observation and investigation, a continuous delight in their seasonal manifestations of blossom and berry. In the burned-over portions of the park a mock chaparral abounds, which is at once a blessing and a hazard. This is composed of the *Ceanothus* (wild lilac). It forms an admirable cover

against wash and erosion, bestows a wealth of color and fragrance during its long blooming period—but forms such a persistent thicket, and is so highly inflammable as to make it a pest to the forester.

TO A REDWOOD TREE.

From a forest poem by CHARLES KEELER.

O tree of trees,
O monarch of the grove,
The mountains sound thy praises,
The birds declare thy glory,
The brooks proclaim thy wonder,—
And all day long the sweet springs sing
To thee their liquid lays,
Thou watcher over birds,
Thou guardian of flowers.
Praise be to thee
For all thy tender care !
The white fog steals amid thy shade,
The sun streams dimly through,
The darkness falls about thy boughs ;
The solemn night is near,
But through its slumbering calm is heard
Thy hymning strain on high.

The Big Fire.

SEPTEMBER the 7th, 1904, was one of those sultry days that occur in this climate only at intervals of years, when the heat bears down from above like a weight, and radiates from the earth with intensified fervor, and the atmosphere is suffused with latent fire, waiting—watching—for some opportunity to manifest itself in flame. And the opportunity came from a sawdust pile at the lumber mill on Waterman Creek.

Warden Pilkington and his co-workers in the park that afternoon discovered a film of smoke above the northern horizon. Presently it was a curling cloud—presto, a denser mass surging against the sky. There was a wild fire, on the hottest day of the year, with the wind driving it parkward with a fiendish velocity. No military call to arms receives the rapid response that follows the cry of "fire." No other fire alarm strikes such terror to the heart or puts such superhuman energy into mortal men, as the signal that announces a fire on the prairie or in the forest. Many men were immediately busy, but on and on came the flames, higher and higher up the mountainside, swifter and swifter, as the superheated air made vacuums, abhorred by the driving flames.

That afternoon of anxiety and spontaneous and speedy effort was the beginning of a battle which lasted for twenty days. There were three ridges and canyons with

creeks for the fire to cross before it could reach the park, but that fire laughed at distance and obstacles, natural and artificial. In the succeeding days, Warden Pilkington had as many as a hundred men fighting the fire and mill men and farmers from all the countryside and nearby towns were engaged in the futile fight.

For weeks the midday sun was a ball of fire in a bank of smoke. The starry heavens no more marked the night, but lurid flashes of flame accentuated the appalling darkness and stifling atmosphere. Although the fire was at times diverted and turned from its course, it was never subdued until rain fell on the 27th of the month. Brands and sparks were scattered over the surrounding country and new forest fires sprang up, until the fire zone extended to the ocean shore, and covered a belt from one to three miles in width.

For nine days Warden Pilkington did not remove his clothing or sit down to eat a meal. Hard work, desperate work, and the favor of Providence saved the central and westerly portions of the park forest, but the scathing fire sucked up hundreds of acres of chaparral and scourged and seared a strip of the finest redwood timber along its easterly border.

In the midst of the fire period the writer rode on horseback over the burned district. Loss of bridges left only three miles of distance from the town of Boulder Creek to be traversed by vehicles. Then the horses swapped harness for saddles. A trackless, trailless area of ashes covered both slopes of Boulder Creek. Fires were burn-

ing at the base of hundreds of magnificent redwoods and flames darted from the tops of tall firs. The igneous atmosphere scorched our faces and the hot ashes singed the fetlocks of the horses as we made our way up on the Cowell tract to Bull Springs, to the summit of the ridge overlooking the devastated domain of the Fire King. Then down into the park. Often compelled to dismount to let the animals clamber down some steep or cross a stream as best they could. Sad scenes there were where once the "Trail Beautiful" had led through redwoods standing "breast-high" to the rider 150 feet above the valley below. Hot tears fell on saddles at the sight of these hundreds of coal black shafts, once the glory of the forest.

* * *

It was alongside this trail that the tree stood that carried fire in its bosom for fourteen months. It was a superb specimen of the *Sequoia sempervirens*. Not a "big" tree, but a perfect one to outside appearance. One could not pass it on the trail without praise for its stately beauty. It was about twelve feet in diameter at the butt, and its crown of evergreen swayed in the breeze close to three hundred feet above. As the fire swept over the crest of the hill, it caught in its topmost branches and instead of swirling up the trunk and through the foliage, it burned down, gradually dropping off limb after limb.

As it proved, this tree, like many others of the larger redwoods, was "ripe." The fire found it "dosey" at the

heart, and the flames that had licked up the limbs subsided when they undertook the task of consuming the trunks.

When the rain came it appeared to appease the fire in this tree as it did in others. Contrariwise, the dampness only swelled the punky interior wood and smothered but did not extinguish the fire. It smoldered silently for weeks and then when it reached a knot hole left by a destroyed branch and got vent, it burst out in flame, burning upward, and consuming the portion of the tree left above. It was now the rainy season, and the flames were again quenched as before. Again the fire smoldered for weeks, and again it burst forth at the faint contact with a ventilating wound in trunk. Rain would repeat the douching process, with similar results to follow, ten, fifteen or twenty feet perhaps being burned off at each eruption. The last outbreak occurred in November, 1905, fourteen months after the initial fire, when the height of the trunk had been reduced to about one hundred feet.

This remaining portion still stands, a monument to the noncombustible character of living redwood, a sad memorial of the awful days when the besom of destruction reigned in its wrath over field and forest.

* * *

How terrible are the destructive forces of Nature, how beneficent she is when her mood is one of favor!

Following the fury of the fire came copious rains and a long season of growth. Vegetation sprang from the

earth with more than Phœnix-like vitality, and within a year the landscape was reverdured.

The young madrones grew so fast they could not support themselves erect, and their tops swayed like grasses in the breeze. Now, after eight years, the visitor finds little in the general aspect to suggest a conflagration. All the redwoods left standing by the vandals are putting forth fresh branches, and in time their blackened boles will be bronzed by new bark seaming through the blackness. Perhaps but for this catastrophe we would never have known how ever-virile this forest was.

Timber Cutting.

THE LEGISLATURE of 1905 conceived the notion that it would be wise to abolish the park commission and place the forest in charge of the State Board of Forestry, an ex officio body, consisting of the Governor, the Secretary of State, the Attorney General, the Secretary of the State Board of Examiners, and the State Forester.

Thus it came to pass that politics, like the serpent of old, entered this garden of the gods, bringing indifference, neglect and "graft" in its trail.

With the administration that came into power in 1907, Mr. J. H. B. Pilkington, the efficient warden, was removed and S. H. Rambo was placed in the position.

The big fire had left in its wake the dead and charred trunks of the Douglas firs and pines and of many hardwood trees, which were an offense to the eye, a continuous fire hazard and a hindrance to the renewing of the forest. The redwoods, although stripped of leaf and branch, and left with blackened bark, were *sempervirens*, still holding on to life and ready to renew the struggle for existence.

Notwithstanding this well known fact, repeatedly verified in the history of fires in redwood forests, Mr. G. B. Lull, the State Forester at that time, decided that these trees were all dead and should be removed.

Under his authority a private contract was made for the cutting of the "dead timber," and in the winter of

1908 occurred the infamous rape of the redwoods, when scores of redwood trees, some of them among the finest in the forest, were slaughtered and converted into posts, pickets, shakes, grape stakes, etc., before the public was aware of the depredations. No words can express the atrocity of this crime against Nature, against the State, against Posterity.

It was supposed that only dead trees were to be removed, not live ones, and it was weeks before the fact became known that the redwoods were being sacrificed.

The Sempervirens Club sent spies into the park, and the Native Sons of Watsonville, under the inspiration of Mr. George G. Radcliff, editor of the *Pajaronian*, always an ardent friend of the forest, did likewise. Their reports confirmed the rumors of the vandalism.

Two days later, the Santa Cruz *Surf* had a timber cruiser, a photographer and a lumber expert on the ground, and within the week the wanton destruction in progress in the park was before the public in all its bald criminality.

The grand jury of Santa Cruz County, of which J. B. Holohan (afterward State Senator) was chairman, took immediate action; George Wharton James, the noted California author, greatly aided the agitation; indignation meetings were held in Santa Cruz, San Jose, Palo Alto and other places, and abetted by the press of the State, a protest was made that could not be ignored by those in power, and the cutting was stopped, although

the contractor was permitted to remove from the park thousands of dollars' worth of split stuff, every stick of which was rank with robbery.

It is gratifying to state that every official who was concerned in, or connived at, this outrage, has been retired to private life, and also that every redwood tree which escaped the ax has sustained its ever-virile fame by sending out living limbs, increasing in length and foliage every year.

Following the Fire.

WITH characteristic human foresight and sagacity, after fire had scarified the fairest portion of the park, active measures for fire protection were taken. A system of fire trails girdling the park, with laterals along the ridges, was projected and has been carried out, until to-day there are twenty-two miles of fire trails from thirty to sixty feet in width, in and about the reserve.

There is a difference of opinion as to the efficiency of these trails in time of stress, but at all events, they will, when properly improved, provide a splendid system of bridle paths, and afford to the "man on horseback" an admirable opportunity for adventure in the forest.

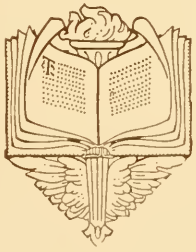
Since the State acquired the property, an excellent driveway has been constructed from the entrance of the

park to the Governor's Camp, a little more than three miles in length.

From the Governor's Camp radiate trails for pedestrians (most of them horsebackable) which bisect the park in different directions.

* * *

Permanent improvements, man-made, in the park consist of a system of waterworks and a sewer system for the Governor's Camp, designed to supply the needs of a population of 500; a building constructed of redwood logs on the margin of Opal Creek, used as a club house, a rustic redwood dining-room with kitchen attached; a log barn, a rustic cottage, called the Lodge, at the entrance of the park; and a system of tanks, pipes and pumps for road sprinkling.



Going In.

ENTRANCE to the California Redwood Park is now via the town of Boulder Creek. Later there will be an open approach from the coast and possibly one from the Santa Clara Valley side, but the seasonal scenic effects will not greatly vary.

It is now two hours by auto from Santa Cruz, one hour from Boulder Creek. The scenic dividends on slower locomotion are great, and the hikers are to be envied above all others.

One of the chief assets of this region is its kaleidoscopic character. There are new scenic combinations and aspects every month. In April the landscape is one continuous unfolding screen of living green.

In May the blue dominates. It is the blooming time of the wild lilac, and the heavens above, the bay beyond and the region round about is all one undulating mass of blue, varying in shade from the faintest azure to the deepest indigo. Following the lilac, the chestnut (tanbark) oaks have their time for blooming, and their peculiar, distinctive shade of green stands out conspicuously amid the general verdure. A little later the azaleas make brilliant and fragrant all the brooksides and byways.

In July the tilled fields have turned dun brown, and the pastures are void of color, but the madronas (the strawberry trees), the real red Indians of the California

forest, are at their best. These trees are ever charming, in form, and foliage, and flower, and berry, but most of all in their bark. No, it is not a bark, it is a skin, delicate in texture, smooth, and soft to the touch as the shoulders of an infant. In the strong sunlight of the summer these trees glisten with the rich color of polished cinnamon. Under certain conditions of light in the late afternoon, the red brown changes to such a brilliant vermilion that seen through intervening foliage it has suggested the red tongue of fire.

There is a human pose to the trunk. Seen through the tangle of the thicket, it looks like the brown, lithe body of an Indian, and in the moonlight the graceful upsweep of its branches is like the careless lifting of a dusky maiden's arms. Every feature of the madrona is feminine.

At this season the glistening lacquer of the new leaves, shifting and changing in the slightest breeze, is offset or contrasted with the leaves of yester-year which have turned yellow, and red, and brown, and still adhere to the tree alongside of the new glossy green leaves, giving the effect of a foliage half yellow, half green. The old bark is peeling off in flakes leaving the new as soft and smooth and shiny as satin. The old leaves as they fall will fade and leave a carpet of pale yellow.

If you enter the park in August, the sere time in California, what? More and more blooms. These lusty bushes by the roadside and others interspersed with other growths along and over the hillsides, which

are so heavy laden with bloom are toyon bushes, and their blooms are the promise of California Christmas berries, those brilliant red berries that vie with the holly and the mountain ash of other countries.

In October it is red route parkward. The vineyards and orchards will contribute a little to this effect, but the protruding presence of the poison oak vine tinges the traveler's vision. Crimson, scarlet or fire-red as it may be, growing in bushy clump, or climbing the trunks of trees and trespassing often on the upper branches, its color penetrates the autumn atmosphere from every angle.

By December travel will be light, but beauteous red berries will be pendant from madrone, manzanita and toyon, and the general landscape will have resumed its April verdancy.

Rocks and Streams.

A DISCERNING man discovered in far away times that there were sermons in stones and books in running brooks. The streams in Sempervirens Park are as ever-living and as everlasting as the trees and the rocks. Amid summer's drouth they abate not their flow, and their merry music can be heard amid the aisles of columnar redwoods, day unto day, night unto night, while the silent voices of the rocks give knowledge to whomsoever heeds.

Everything that geology wrought here was turned topsy-turvy by the elements, and so we find to-day huge boulders of buff sandstone, "big as a meeting-house," wave-worn, water-carved into castellated form by ancient oceans, lying on the very crest of the ridge bounding the basin, more than two thousand feet above the present sea level.

Downward, southerly, from the ridge road, the rocks have been sea-washed and weather-worn into hundreds of picturesque shapes, many of them suggestions of idols or images, and there is a half acre well worth visiting that is suggestive of some ancient cemetery, the outstanding rocks not unlike memorial stones. In other places, the waters cleft the ridges, forming cliffs from fifty to two hundred feet in height, in every instance tapestried with moss and ferns and foliage plants,

Photo by Appleby.

Scene on Sempervirens Creek.

veritable hanging gardens of a beauty which altogether eludes words of description.

All of the streams in the park are rock-bottomed, the soft sandstone of the hillsides solidifying under water until it is "hard as a rock." Boulders and cobbles of conglomerate rock, lifted out of the bed of the streams by the current long ago, have left curious "pot-holes" in the bed of the creeks in many places, causing diminutive cataracts and rapids, which add much to the picturesque beauty of park streams.

Because of the varied altitudes in the park tract, it is manifest that rapids, cascades and waterfalls must be numerous. Not all of them are yet accessible, but those who spend a day in the park usually make the trip to Berry Creek falls, the reward for the walk being divided between admiration for the wonderful verdure on the way and the joy of beholding the brook pour over a declivity of about seventy feet in a sparkling chain of mingled light and water. Sempervirens Falls can be seen—and heard—from the driveway, and there are several other accessible cascades on the same stream.

Josephine Clifford McCraken in one of her visits to the park, wrote of the beautiful glimpses of Sempervirens Creek, and the short space of Opal Creek which was visible, and adds: "We could not visit other streams in their solitary beauty of cascade and deep pool hidden in monster fern and tangled wildwood."

Nature left to her own devices for ages, eroding the rocks, plowing enormous furrows through the hills,

rearing mammoth trees and then toppling them to earth, has filled up the channels of the creeks in many places with a mighty mass of debris, which it is man's work to remove and render the flowing waters companionable.

Something of this work was done in the season of 1911, and it will be continued through the aid of the private benevolence of Mrs. Phoebe A. Hearst, until sufficient State aid is secured.

In a report on this work, the Commissioner in charge wrote:

> In a distance of a quarter of a mile, we found five log dams or jams of driftwood, sufficient to obstruct the flow of the stream in high water. We found over twenty fallen logs in the creek bed or across it. Seven of them we converted into rustic bridges, five of them with a substantial guard rail. Most of the others yielded themselves to some sort of useful or picturesque treatment. One enormous fir lying directly across the stream has accumulated a mass of moss on its upper surface, which with the decaying wood has formed a soil sufficient to support a mass of huckleberry foliage and there is also growing on this log, wax myrtle, azalea, fir and oak shrubbery, together with a profusion of ferns. Fortunately, lying nearly alongside this log is another which we were able to convert into a bridge and from which this log-garden can be viewed its entire length.
>
> Not a rod on either bank did we find free from verdure, although this was late August. No words can describe the refreshing beauty of this brook as it was revealed day after day by the removal of the dead rubbish that had encumbered it. Most of the way it is overhung by tree branches far overhead, then a veil of azaleas and huckleberry, near the edge of the banks, while down by the waterside are tiger lilies, many varieties of fern and other wild plants. As a test of your credulity, we might mention that we measured the stalk of one

tiger lily eight and one half feet, and another we found flourishing and blooming from a redwood log, the bulb having evidently been driven into a split in the wood at a time of high water.

In several places huge blocks of sandstone have fallen from the cliff on the southerly side of the stream and rolled to the bottom or lodged along the bank. No sooner are these at rest than they become coated with moss and are attacked, so to speak, by profuse growths of Saxifrage (the rock splitter). Into the tiny, almost imperceptible crevasses made by this plant, seeds fall and larger growth begins. In one instance here, we have a fir tree three feet in diameter which started in a rift in the rock and has split it wide apart. A young madrone is attempting the same feat on another rock near by.

Details of curious growths, of majestic trees, of the many freaks of nature exposed would weary you. I cannot conclude, however, without mention of the spot where a log jam at some point in the past had backed up the stream until the banks became water soaked, causing sound oak trees of considerable size to topple over. In falling they struck the top of the log jam, and have remained in a horizontal position since that time without slackening their growth. In the mean time, the creek forced its way to the side and wore out the land underneath, until now these oaks form a living evergreen canopy about eight feet above the creek bed. We constructed several side paths from the trail to the stream, and made it accessible, so far as we went, for fisher-folk and brook lovers.

Every mile of waterway here is a rare and valuable asset, which, with sufficient funds, might be made not only a joy to the trout seeker, but a delight and solace to those who find in communion with Nature, their most helpful uplift in life.

The temperature of the water in the park streams rarely rises above fifty degrees, and consequently a mess of trout taken in midsummer are fine-fleshed, affording fine sport and fine food.

Photo by HHI. Scene on Opal Creek.

Flora of California Redwood Park.

By Dr. Isabel McCracken of Stanford University.

MANY people make the mistake of trying to see the Park in an automobile. A flying trip from Boulder, an overnight stay at Redwood Inn and away in the morning leaves the delightful memory of a magnificent drive, a grand old redwood forest through which the light shimmers to the huckleberry undergrowth, pretty streams tumbling in cascades over rocky ledges or flowing leisurely beneath a canopy of delightfully fragrant azaleas. But the traveler who leaves the main road to follow the trail, to push into the woods with blazing hatchet, discovers picturesqueness and grandeur only hinted at on the open road, and a flora abundant and remarkably various.

The species of shrubs and flowers of the park run well into the hundreds, and a day's tramp from the Inn up the China Grade trail to Butano Ridge and out on the "fire trail" skirting the eastern rim of the Basin, within which lies the park, or down the Waddell to Woodwardia Falls and thence to Pine Mountain, well repays the observer in the richness and variety of verdure that will meet him on the way.

The deep woods, the brookside, the trail, the sunny ridges, the mountain peaks, each furnishes its characteristic foliage and flowers, its quota of lichens or mosses, liverworts or ferns.

The redwoods (*Sequoia sempervirens*) of the forest, with their tall columnar shafts, longitudinally fissured, towering into the upper air from the floor of the basin or marching in procession up the numerous glens, interlock their lofty branches with those of the Douglas spruce (*Pseudotsuga taxifolia*) and form a canopy over the various undergrowths through which the light shifts sparingly. The oaks and madrones reach up spindlingly in an effort to penetrate this upper thicket of green. The huckleberry, the principal undergrowth of these woods, catches the shafts of sunlight and screens the shiny-leaved salal, the oxalis, the dainty starflower (*Trientalis*), the whipplea, yerba buena, and yellow violet.

There are but two living species of redwood or Sequoia (named from the Cherokee chief Sequoiah), the coast redwood (*Sequoia sempervirens*) and the Sierra big tree (*Sequoia gigantea*). In the one, the leaves are elongated, borne on short stems and extend forward and outward from the main stem in a flat spray. The cones of the coast redwood or *sempervirens* are about the size of a thimble, ripening in one season but persisting on the branches after the seeds have been discharged. In the sierra redwood the leaves are awl-shaped, sessile (stemless), and extend around the main stem. The cones are as large as a hen's egg, and mature the second autumn after formation. It is curious to note the tendency of the *sempervirens* to form a leafage like that of the *gigantea* in its upper branches, thus bearing testimony to their relationship. The park is a sempervirens forest.

The pine family is represented in the park by two species, the Douglas spruce and the knob-cone pine. The former, already alluded to, shares the floor of the basin with the redwoods, the latter shares the heights with the manzanita and other chaparral.

Douglas spruce is commonly referred to as the Douglas fir, and in the Oregon woods as the Oregon pine. It is, properly speaking, neither a pine (*Pinus*), a fir (*Abies*), nor a spruce (*Picea*), but a member of the genus Pseudotsuga (*Pseudotsuga taxifolia*). As its name indicates it is a near relative of the hemlock (*Tsuga*) having also many spruce-like characters. It may be identified by the conspicuous deeply notched bracts with their spear-like points applied to and extending beyond the scales in the cones. The cones are found in abundance on the ground under the trees. The bark of the tree is deeply and irregularly fissured. The cones of Pseudotsuga, like those of the spruces and hemlocks are pendent, while those of the firs are erect.

The knob-cone pine (*Pinus tuberculata*) is characterized by rather thin foliage with needles in groups of three. The cones are in whorls, strongly bent inward toward the tree, and persisting along the trunk of the tree throughout life.

The oak family is represented by several species. Most abundant of these is the tanbark oak (*Pasania densiflora*). This tree may be identified by its grayish bark and its oblong acute leaves, strongly parallel-veined on the under side. The staminate flowers are borne in clusters of long

catkins of disagreeable odor, like that of the true chestnut. The roundish acorns are supported by cups bearing fringe-like appendages. This tree is said to form a link between the oaks and chestnuts. The little scrub oak (*Quercus dumosa*) is found commonly on the fire trails and exposed places, sharing these with the abundant poison oak, a shrub, belonging to the family *Anacardiaceæ,* which could well be dispensed with in the California woods, though alluringly beautiful in the fall when the leaves turn to shades of scarlet and bronze.

There is a most beautiful grove of oaks (*Quercus chrysolepis?*) on the fire trail on the eastern side of the Basin not far north of where it crosses the park road at the "summit." This grove is a favorite sporting place for the birds. Flocks of bluebirds, yellow warblers and black-headed juncoes flutter about in the sunshine, and nuthatches run up the trees like woodpeckers, pecking into the cracks of the bark for their noonday meal.

Another grove of oaks, delighting the eye of the traveler, stands in the park on the main drive, where it crosses Flee Potrero, more appropriately called Deer Potrero or Deer Glade, for to this quiet, grassy spot the antlered buck, the doe, the young fawn come each day at sunset to nip their evening meal.

The Yew family (*Taxaceæ*) is represented by one species, the so-called California nutmeg or Tumion (*Torreya californica*). The leaves on this tree, like those of the redwood and pseudotsuga are arranged in a flat spray. The bright, glossy, green leaves, tipped with sharp, rigid

points and their nutmeg-like fruit, make the identification of the tree unmistakable. This species occurs as individual trees, never in groups.

The California buckeye (fam. *Sapindaceæ*), while not found in the depths of the forest, is abundant on the sunny slopes of the ridges, on the fire trails, and occasionally along the gulches. Here, however, it does not grow into the robust tree as in the foothills. The foliage is less abundant, but the flowers no less showy and sweet scented, attractive to the bees and butterflies who seek its store of sweets. The tree may be known when in flower (May, June and July) by the large showy clusters of white flowers tinged with buff, with rose and pea-green. The leaves are spread from the end of the stem like fingers from the palm of the hand, with five to seven leaflets. In the Fall the leafless tree may be identified by its burden of pear-shaped fruit conspicuously pendent from the ends of the branches.

The toyon or California holly (*Heteromeles arbutifolia*) has secured a footing here also. It is found in company with the buckeye, but it also fails to reach the handsome proportions of its relatives in the foothills.

The buckthorn family is represented by the coffee berry (*Rhamnus*) and several species, blue and white, of the California lilac.

The coffee berry, with its olive-like leaves and inconspicuous yellowish flowers, is a veritable picnic ground for all flower-loving insects, and when one hears an

unusually busy hum of bees, he may know he is in the neighborhood of a coffee berry bush.

The mountain lilac forms an impenetrable thicket on logged hillsides. It fills the air with a delicious, peachy odor and harbors flocks of mountain chicadees and juncoes. The beauty of a hillside of purple or blue or white is unsurpassed, and the bush would have many friends were it not for the fact that it harbors the wood-tick.

Perhaps the choicest shrub of our mountain woods is the beautiful and fragrant azalea (*Rhododendron occidentalis*), with its fine, large clusters of handsome white blossoms, blotched with yellow and sometimes shaded with pink. In the park we find it at its very best. It follows the numerous brooks and creeks that find their way through the Basin, gracefully throwing its branches out over the quiet pools, where the fishes dart, and over the tumbling rapids where the water ousels sport. Its charming clusters of blossoms and leaves of a rare, fresh green may be seen on all sides throughout the early summer months, but nowhere in greater profusion than out on Trail Beautiful, well on toward the China Grade turn-off.

The shrub most characteristic of the park, with its rich shining green and graceful branches, is the huckleberry. It forms the main forest undergrowth. Its small pink and white waxen bells, its no less beautiful foliage and delicious fruit, delight the woods lover peculiarly.

In company with the tall redwoods, the pseudotsuga,

the oaks, the huckleberry, wherever an opening affords, one sees a thickly branched evergreen with thick, dark green, glossy, elongate leaves. This is the wax myrtle (*Myrica californica*), adding its peculiarly delightful spicy fragrance to that of the azalea blooms.

Beside the huckleberry, the family *Ericacea*, or heath family, furnishes several other species differing much in appearance and habit, the madrone, manzanita, salal, pyrola and the saprophytic pleuricospora.

No tree of the woods can surpass in beauty the madrone or Arbute tree (*Arbutus menziesii*), with its beautifully polished terra cotta bark assuming a rich hue, where the sun plays upon it continuously. In peeling the bark becomes fissured into small flakes. Its rich, glossy, leathery leaves and red branches and dainty white bells in the spring, its brilliant display of red gold and green in the summer, the old leaves turning a burnished red before falling, its globular, scarlet berries in the fall, make it a very attractive tree all the year round.

Isolated madrones stand here and there in the woods contending with the oaks and wax myrtle for a share of the sifted sunlight. Many superb madrones are to be found on the Maccabee mule trail and a lovely grove on the Hollow-tree camp trail a half mile or so beyond Maddox cabin.

Leaving the woods on any of the trails by means of which one reaches the ridges, one finds, sharing the mountain slopes with pickeringia, chamise, scrub oaks and knobcone pines, the shrubby manzanitas (*Arctostaphylos*)

Manzanita in Bloom.

with their bushy tops, smooth mahogany red limbs and white urn-shaped flowers, or small apples kissed on the sunny side to old rose or red.

The *Pyrola* is a beautiful little leafless parasite belonging to this family. It is found not uncommonly springing in the trail almost under foot of the traveler. Its red stalks, a foot or less high, carry upward the delicate, deep rose-colored flowers, hanging like fairy bells upon their short stems. In the deeper woods these flowers are white, barely tinged with pink.

Another plant in this family here met with is the dull whitish saprophyte *Pleuricospora*. It is interesting from its relationship to the red snow plant of the Sierra. Its thick white leafless stalk grows from two to eight inches

Ceonothus or Wild Lilac.

above ground in the denser part of the woods, and frequently upon the trail, and terminates in a compact mass of flowers, persisting and withering with the stalk.

Much of the beauty of the trails through the woods is due to the lovely prostrate shrub, the salal (*Gaultheria shallon*). The bright green leaves of this spicy evergreen are beautifully contrasted with the dark leathery older leaves. The pinkish white bells dangling beneath the leaves are veritable fairy bells. The blackish berries are aromatic and edible, though rather tasteless, and are said to have formed an important diet among the Indians.

Toyon or Christmas Berry.

The most unfriendly shrub of the locality is the pea chaparral (*Pickeringia montana*). Ascending the Pine Mountain or China Grade trail one meets with this densely-branched, spiny evergreen, with gray-green leaves, spreading out over the slopes and mountain sides. Its magenta-colored pea blossoms cover the bushes with a

mass of color during the early summer. Its long thorns warn the explorer not to be too ambitious in penetrating its thickets.

One of the most interesting of all the shrubs of the region, peculiarly so on account of its localization, is the golden-blossomed slippery elm (*Fremontia californica*). Its large hibiscus-like blooms are very handsome in the shrubbery of green. It grows only on the mountain slope over which winds the China Grade trail, and is first met with a half mile or so on the trail after it leaves the Opal Creek for its sunny ascent. This bush reaches a height of ten to fifteen feet or more, and may be recognized when out of bloom by the dense whitish felt clothing the under surface of the dark green ivy-like leaves and the tough leathery bark.

The iris family is represented by two species, representing a succession of blooms. The cream-colored irises (*Iris douglasiana*) greet the April visitor in the deeper woods and the blue-eyed grass (*Sisyrinchium bellum*) welcomes the summer visitor to the fire-trail and clearings. The blue-eyed grass appears more like a familiar friend whom we have taken with us from the valley below than as a natural inhabitant of the place.

Three orchids are characteristic of the park flora. One, the reddish-brown leafless coral root (*Corrallorhiza multiflora*), not detected by the casual observer because of its nice blending of red-brown stem and flowers with the dead leaves and needles upon the ground, is, like *Pyrola*, fairly common and to be found in similar situa-

tions. Another orchid, a species of Cephalanthera,* pure white and leafless, is rare. The third species, a rein orchid (*Habenaria*), is quite abundant. Its long ribbon-like leaves appear above ground in the early spring. Later the long slender stem shoots up, carrying its delicate array of greenish buds. The buds unfold slowly, and its blooming season is long. When summer wanes the greenish-white flowers may still be found in shaded corners.

There is no more refreshing sight in the park anywhere than that of a cluster of tiger lilies, standing erect in the shadow of a great boulder or under an overhanging bough, and nodding their spotted orange petals over the rippling or rushing streams or reflected from a quiet mirror-like pool. In one of the most enchanting spots along the East Waddell a group of these peer over a great moss-covered log, like guardians of the spirit of the stream.

The one who has a real affection for the brookside has a grudge against the usual fisherman. Not because he beguiles the unwary fishes with his tempting fly—there are plenty of fish in these streams to spare a few for his pleasure—but for the reckless way in which he crashes through the magnificent stalks of these stately flowers as they bend their graceful heads over the pool, leaving ruin in his trail.

Early in the spring the large rich leaves of polished

*Found in this locality for the first time by Mrs. Juanita Gerlach, June, 1912, on Trail Beautiful, not far from park boundary, and determined by Professor Abrams.

silky green of the beautiful lily, Clintonia (*Clintonia andrewsiana*), appear above the ground. The blossom stalk soon appearing, carries high above the leaves a cluster of lovely blossoms—deep cerise in the more open woods, delicately pink in the shaded nooks. During the sunny July days the flowers give place to the green berry-like fruit which quickly ripens into a rich indigo blue. The leaves, the flower, the fruit, all combine in a richness and uniqueness of feature which makes the Clintonia one of the most distinguished of the woods plants.

The lily family is further represented by the wake-robin (*Trillium oratum*) coming early with its pure white blossoms in its setting of three large green leaves, white in youth, pink in age, false Solomon's-seal (*Smilacina amplexicanlis*), star zygadene, the soap-plant (*Chlorogalum pomeridianum*), whose bulb is useful to the camper who has left his soap dish in town, several brodiæas, blue and yellow, with a rare pink specimen, two species of Mariposa lily, one, the beautiful and dainty whitish globe tulip or fairy lantern bell (*Calochortus albus*), and the other the little star tulip.

Covering all the ground, like a carpet of green is the sorrel (*Oxalis oregana*), its delicate white blossom pinkish in age, amidst bunches of trifoliate, heart-shaped, spotted or green leaves. The "good luck" leaf of four leaflets occasionally rewards the observant.

The long graceful sprays of Yerba buena (*Micromera chamissonis*) trail and interlace over the carpet and yield a delicious aromatic fragrance that delights and charms

the passer-by. The flowers are small and white and appear in the axils of the leaves.

The pretty trailing underbrush, the whipplea (*Whipplea modesta*), keeps company with the yerba buena with its exquisite little clusters of white blossoms and delicate fragrance.

The very dainty little pink star-flower (*Trientalis europœa*) on delicate thread-like stem, in clusters of irregularly shaped leaves, lends itself most attractively to the patterning of the woods carpet. The yellow wood violet (*Viola sarmentosa*) and the little western hearts-ease (*Viola ocelata*), white within, purplish without, add their color and charm.

Of all the flowers that fringe the stream none are more at home than the western Boykinia (*Boykinia elata*). The long slender stems clothed with rusty glandular hairs carrying their sweet-scented sprays of small whitish flowers dashed with a purplish brown tinge, become, with the other saxifrages that neighbor with it, the mitre-wort and alum-root, and with the ferns and reeds a part of the personality of the brook itself.

These three saxifrages may be easily distinguished though somewhat similar in leafage and habit. The fragrance of Boykinia sets it apart. In the alum-root (*Heuchera*) the flowers, though smaller, grow in a loose panicle as in Boykinia, the leaves are, however, more deeply lobed, of a mottled green and veined, particularly late in the season or in exposed situations, in dark red or brown. In the seed pods of the alum-root the two valves

are equal in length. In the mitre-wort (*Tiarella unifoliata*) the small white flowers are arranged along the stem, the seed pods are formed of two valves, one of which is conspicuously elongated.

In these woods the saxifrage-like mist-maiden (*Romanzoffia sitchensis*) is present, but rare.

Upon almost any walk one finds the lovely plant of our coast woods, the American barrenwort (*Vancouveria parviflora*) with its sprays of white flowers. It is particularly noticeable from the likeness of its leafage to the fronds of the maiden-hair.

Among the most attractive blooms of the chaparraled hillside, above the redwood line, are the golden flowers of the tree poppy (*Dendromecon rigida*). Its rigid pale green leaves and whitish branches form a great contrast to the darker green of the chamise, the manzanita and scrub oaks with which it keeps company. It has a long blooming season, coming early and remaining late into the summer.

With their flowering season almost parallel with that of tree-poppy and growing in somewhat similar situations, particularly around the rim of the Basin on the north and east, on fire-trails and sunny hillsides one sees grand displays of the mountain balm (*Eriodictyon californicum*) with its pale colored lavender flowers and aromatic gummy leaves, the pitcher sage (*Sphacele calcina*) with its large white flowers aptly called "pitchers," and the bushy monkey flowers (*Diplacus glutinosus*) with their saucy orange faces.

Hosts of other flowers greet the wayfarer who leaves the woods for a day's tramp on a trail that takes him out into the sunshine, patches of glowing Indian paint brush (*Castilleia*) with their brilliant dashes of color, or masses of the rose-pink godetia with its splotched satiny cups, or now and then, its fairer sister Innocence (*Collinsia*) or sheets of the lavender mint (*Monardella*) with its clean, spicy, refreshing odor, in favorable situations the red and blue larkspurs, the pedicularis or Indian warrior, the hedge nettle, wild cucumber vine (*Chilicothe*), vetch, sweet pea, the salmon-colored starry pimpernel (*Anagallis arvensis*) with its rich purple center, the charming pink flowers of the Canchalagua (*Erythraea venusta*), "fresh, wide-awake in appearance, reminding one of a rosy-faced country wench," morning-glories, forget-me-nots, California milkwort (*Polygala californica*), the fragile bluebell flowers (*Campanula*), the wild strawberry, the blackberry and hazel, spiræa, euonymus, bed straw with its fishhook bristles, the thieving broom-rape sending its rootlets into the fibres of its self-supporting neighbors, and many others.

No account has been taken of the various grasses growing everywhere outside of the denser parts of the forest, the beautiful ferns and horsetail (*equisetum*) growing so luxuriantly along the watercourses, nor the more lowly plant life of liverworts and lichens.

Woodwardia Glen, a mile or so above Woodwardia Falls on the Pine Mountain trail, where the luxuriant fronds cover an acre or more and grow as tall as a man,

or the numerous gulches where the *equisetum* spreads its airy mass of spring green, a fallen monster lying across a brook, having become with age and moisture a veritable garden of mosses, lichens, liverworts — and supporting in its decaying tissues, young forests of huckleberry, tan-bark oak, seedling spruces and other growths — the "cave" with its ceiling tapestried with a rich coating of pale green, olive and pink lichens, these, too, are worthy of a place in a chapter on the flora of the park.

The Cave.

By Virginia Garland.

THE cave is a grey green grotto, scooped out of a sandstone slope set high over a small crater canyon. The path of approach climbs the brushy, tree-pillared hollow on to the floor of the alcove hanging over the leafy depths. The dun green tinting is of mould or lichen; and some mineral tincture has left here a shadowy washing of soft green.

The walls and roof are grotesquely carved. The long head of a hound shows faintly, the galloping flanks of a horse whose front you must imagine, disappearing in the stone. Satyr faces bulge from the ceiling. Fragmentary moldings, disconnected reliefs, whose origin and meaning are probably as hard to fathom as the hieroglyphics in an Egyptian catacomb.

On the floury sand of the floor, the footprints of passing wood creatures, heavy hop of a toad, mad whirl of a merry cotton-tail, and the cranium-dotted trail of big black beetles, whose habit is to pause often and stand on their heads.

Under the ledges in far corners, the bedding form of some larger creature. Perhaps the bobcat or the fox dozes here.

Curved and hollowed like a shell poised over the windy canyon, the cave holds a peculiar phonetic quality, alternately hushed and filled with sound. A pleasant eerie

sensation to stand in the momentary stillness and hear the oncoming pattering murmur. Swept from high ridges, gathered up from grassy hollows, trailed ground from the hillside, from the ground, from the sky sound on the wind is sucked up through the drafty crater and flung under the eaves of the cave to echo in pulsing confinement. Listening here you are literally an eavesdropper, but unless you have been false indeed to the Open, you will hear nothing against yourself.

Sometimes the wind shifts, pulls away from the pit below, draws all the music and the whispering murmurs out of the cave. Then there is a strange quiet in the place. The carvings come out more distinctly; the little grotto seems to recall some silent, ceremonious happening, some pagan procedure, and if your fancy sees a hushed Druidic rite performing, your fancy may be as near the truth as if it played with an exact science.

Light and Shadow in the Park.

By Virginia Garland.

IT IS perhaps thrice, or twice, it may be but once, in a lifetime that we come mind to mind, heart to heart with poetry. The wide surge of the ocean, the mighty pæan of a storm, the great epic, the world masterpiece, may leave us cold, and in some open, mobile moment, a shadow on a wall, a child's smile, the surprise of another hand laid on ours, and the great exaltation throbs in our soul.

Year after year we may be insensate to the trooping marvels of beauty that pass and repass with the dawn and the dark, and some small, oft-overlooked thing will suddenly fuse our imagination into the white light of understanding.

And when by peculiar training, by burning sorrow, by love, by misfortune, by innate, inherited tendencies, nurtured and guarded in grief and in joy, we come at last to be tempered to a state that often rings true to absolute beauty, yet it is here, too, that the lowly sight, the little, common thing may unexpectedly lift us to the greatest heights.

So it was that one morning in Sempervirens Park I did not for the time being note the magnitude of the

Sequoias, the vastness of the sky, the mighty folded and outflung geology of the hills: I only saw the fall of light on little vines and mosses, the luminous tinted shade upthrown beneath the tiny tangled leaves, the beamy labyrinths of sunshine that underthread the lowly grasses.

Minute ferns unfold and cast their seed beneath a thatched roof of larger ferns; small vines creep and strive, wreathing over their allotted bit of shadowed soil; a delicate forest peeps out here and there underneath a higher, stronger luxuriance.

Much of this winding, tender jungle does not perceive a solar center ; for these hidden herbs the sun does not rise and set in a round blaze of glory. Their subdued sun is the reflected light from a pool of sunshine on a big leaf near by, the dispersed glow from the quivering spot of fire, on the flowing brook, or the refracted lustre turned aside from a sunblazed rock and filtered into their screened concealment. From the one source a thousand springs of light caught and held in intricate variety: from these shining wells a million sifted sunrays darting, piercing, curving into the smallest retreat, finding and feeding the tender plants that sheer unblended sunshine would wither and blight. Worlds within worlds along the forest trail, little realms of greenery revolving around each sun filled spathe, every leaf placed in dainty relation to every other leaf, the shadow of sprig and spray cast at the appointed moment over the gilded delicacy of an overheated tendril; and the vision is startled and upheld in

as great heights as if one had been carried into eternal space and watched the planets revolving at his feet.

Hearing the little leaves singing in the sifted sunshine, you hear the song that the stars sing together.

* * *

I had watched the moonlight merge slowly into the light of day; so slowly I could not fix the moment when the dense patches of white lifted from the floor of the forest became transparent over the faintly showing ferns and lichens; when the ivory and black that wrapped the trees about, blurred and broke in gauzy rifts, letting the first pale glimmer of green shine through the dissolving moonlight.

Drawn across the dawning a scale wren's tremolo whistle, eager with morning joy, yet so pervaded by the mystery of the transformation, I knew the bird had been awake in the white moonlight waiting for the break of day.

Little candles of sunlight began to twinkle on the tip of the tan oak leaves; kindling sparks dropped from the sunrise fires on the horizon-watching redwoods.

Then the incandescent points spread in diffused fire over the leaves. Heaped layers of sunshine seemed to press the branches down with a burden of gold, that lowered from spire to bough, from bough to the forest floor, traveling down the trees as an hour before the light of the moon had shifted and moved upward.

The sun was in the sky.

Photo by Appleby. Berry Creek Falls.

Birds, leaves, brooks, winds were singing the sunrise song, that matin hymn a darkened humanity has forgot and left to the dwellers of the wild.

The sun fathomed with a shimmering plummet a deep canyon of the basin. Through a gap in the walls, the following shadows underlined, upheld further vistas, curving about, hollowing distance, drawing bright pictures nearer, down a telescope of velvet shade.

A silver redwood shaft rubbed midway with a russet stain, where a falling tree had scraped aside the weathered bark, bringing a shreddy blur of cinnamon to the surface. On the warm red background, a shadow spray of madroño leaves, moving softly, swinging up against the russet tone, dipping its lower outlines into the silvered bark, curveting and flickering as if the wind surely touched its unsubstantial contour. I looked in vain for the actual breeze-fingered madroño spray, then back to the phantom picture, whose etherial composition seemed more real than the growing leaves hidden, lost among green hosts.

Along the stream the light shining through the leaves is green and golden. The foliage has become transparent. Woodwardias, burned and thin, radiate an amber tint. Rosetted branches of azalea leaves, suspended by frail stems, float airily over the water, transmitting a topaz glow. They seem no longer leaves, rather are they spattered patterns of sunshine. Side by side with the real marquetry of light, yellow leaf and yellow sun patches can hardly be distinguished apart; and when the

gloaming comes down the canyon the green dusk is lighted for an hour by these leaf-shaped bits of concentrated sunshine.

There is the keenest value in autumn sunshine. In the days of golden light that come between the unrestrained glow of summer and the wan sunshine of winter, there is, if it may be so described, an experienced, mature play of light. No exuberance wasted, every touch with telling effect, and the warmth and color and thrill of this late, passionate sunshine is like the smile of a sweet, wise woman learned in the power to charm, yet unworn and vital in emotion.

* * *

Water is glazed over to most eyes; its depths covered by the veneer of its main color. The surface observer sees little else but a grey or green or blue expanse, quiet or disturbed, as the case may be. But once get a glance into the green lift of a curling wave through whose incredibly delicate walls the sunrise or the afterglow penetrates; follow a shaft of light down deep in a mountain pool, or seek the oblique sight of oily colors mingling on a calm lake, and forever after the light and shadow will show you a world of magic in water. The earth's aspect is frank, open, simple compared to the mystery that lies in aqueous depths. There is nothing under heaven which can so persuade one of merry sorcery, of the spell of incantations, up-called dripping sprites, unseen singing.

the chucklings of pixies and all wood fantasies and all river mysteries, like the long water falling into a hidden green pool sunk in a mossy mountain cleft. Drive Pan from other fastnesses of the hills and you will still find him fingering his reeds, his hoofed limbs crossed, comfortably settled somewhere about the rim of the malachite colored bowl.

I came to watch the light play into the green pool, but would hear laughter, laughter shaking in the ripples. In the white cascades falling, with an upward rise of foam and a glee so ascendant, they seemed to be climbing up, as well as down the rocky rifts, I saw water babies turning over and over. Every splash was the dive of an elf. Do the beryl depths not call to you ? If there is anything akin to river spirits in your blood, your heart pounds and dances with the falls ; you want to sink down, down in the gold flecked pool and the tingling cold will be a delirium, a fire in your veins ; you will rise dripping, renewed, remade. For half a minute, a fluid purer and nearer the source than your own tepid human blood throbs in your veins.

One strand of the glassy fall swerved, struck a projecting rock, shattered to a million drops, denting the pool with sparkling points. The main stream dropped straight into the green water, forming an embossed milk white circle of froth, that rose from the green chalice ceaselessly opening, constantly blossoming, springing from the emerald level, a white wonder of whirling flower foam.

Out of this marvel is born another—air bubbles. But

have you seen them when for a few fleeting moments in the light that comes up through the virescent liquid, they become live jewels, skimming, darting irridescent miracles of mixed water, color and air?

The effervescent, formless ether, caught in the pulsing beat of the cascade, carried down into the mountain tarn, mysteriously moulded under the water, floated upward, swimming over the surface, cast into prismatic globules that quivering, hold all the colors of heaven and earth. You must have eyes to see; your attention must not waver. One glance will not give you their beauty. Only the long, penetrating gaze will melt your own clouded perceptions and the glaze that closes all water over. If your pursuant faculties have not caught just the right illumined moment of the passing sun-touch, on the little round spheres, they are but dancing air bubbles, colorless and commonplace.

These evanescent glimpses of beauty that we may discover at any hour in the round day of sunshine and shade, are creative through the awakened consciousness as well as revealing.

In a sense, their beauty is not there until we see it; our perception of the irridescent bubbles forms, paints and imbues them with life; for Nature is guided by, while guiding the vision of man. The soul of the earth and the soul of humanity forever touch and mingle. Out of supreme generic forces our conception of beauty brings forth to the eye especial forms, specific expressions of loveliness and life unseen before.

Poetry is not poetry until human hearts beat with its rhythm, until the blood in us sings with its melody, until the mind reaches upward, finding in every song a movement toward God.

What matter if it is a shadow, a smile, a floating air bubble that brings the soul for one moment in perfect harmony with the Universal Pulse?

THE MADRONO.

Captain of the western wood,
Thou that apest Robin Hood!
Green above thy scarlet hose,
How thy velvet mantle shows:
Never tree like thee arrayed,
O thou gallant of the glade.

When the fervid August sun
Scorches all it looks upon,
And the balsam of the pine
Drips from stem to needle fine,
Round thy compact shade arranged,
Not a leaf of thee is changed!

When the yellow Autumn sun
Saddens all it looks upon,
Spreads its sackcloth on the hills,
Strews its ashes in the rills,
Thou thy scarlet hose dost doff,
And in limbs in purest buff
Challengest the somber glade
For a sylvan masquerade.

Where, oh where, shall we begin
Who would paint thee, Harlequin?
With thy waxen burnished leaf,
With thy branches red relief,
With thy poly-tinted fruit,
In thy spring or autumn suit,—
Where begin, and oh, where end,—
Thou whose charms all art transcend?

—*Bret Harte.*

Autumn Color.

By Virginia Garland.

N these Autumn canyons, red is subordinate to green and yellow. You must search for the touch of scarlet and crimson and when you find it, the bright surprise is more charming for its rarity.

Long sprays of honeysuckle festoon the brush, tipped with clustering scarlet drops. The Red huckleberry bushes are hung with coral beads. The false Solomon's Seal is heavy with large berries. You wonder how the tiny, white flowers that formed its feathery summer plume could so develop in fruiting size. You are always wondering in the woods. If you have lost yourself in the shadowy spell of the forest, you come to the ways of men again with the clear, wide gaze of a child, the crow's feet and the fretting concern washed from your eyes. But if you care more for the personal effect than you do for the deep delight of the woods, the wrinkles and the worry will still be there. *Lose yourself.*

Along the streams, the thin, yellow leaves of Burning Bush shade its pretty, pendant fruit. The outer pink encasing rayed open, from the four sections, attached by frail threads, hang the scarlet swinging seeds. The virulence of poison oak is all forgotten in the delight of its high flaunted red ; a running flame in the cool green

canyons, a girding fire about the lavender grey spruce trunks and the rufous boles of the *Sequoias*. When the sunlight strikes the encircled shafts, an effect of fire glow is given in more than color. The tree appears to smoulder in heat. The wreaths flicker in the wind, moving jets of red play over the bark, and the moted sunshine is a smoky yellow haze that wavers between the red, lapping vines. Near to the tree you smell the pungent odor of warm bark and hot red leaf.

On the open ridges toyon berries are washed in early scarlet. In a month they will be deepest crimson. Here in the park, there will be no plundering hands to take them from their best appointed place.

The madroño's granular berries swing in all shades of red and orange. The curled up funnels of colorful bark are cast down with prodigal carelessness, returned each year to the source from which they came.

The upper limbs twist and twine in young, naked toning. Out of the sunlight and wind and rain the tree will recall its discarded color, recloak itself again in all its burnished beauty. Forever casting off its painted sheathing, flinging itself to the winds, weaving ruddy suggestions into fixed and fiery copper, only to roll up the incomparable hues, to throw them broadcast, starting the color shuttle again upon the first woof of its pale tan texture.

The madroño gives lavishly—it might appear wastefully. Ah, no, it gives wastelessly; it has the secret of giving and taking without stint or limit; putting out measureless expression to profit, that old secret whose

warrant is written in an Ancient Book, "To him that hath shall be given."

A gleam of blue above the moss and fern where clintonia leaves droop upon the earth; their wet smoothness melting into the soil. On the tall stem where once pink lilies hung, a rare fall of lapis lazuli beads. Birds are fond of the blue berries; they are seldom left in ample numbers. Water dogs and snails eat them, too, I believe, for we find the long stems pulled down, laced back and forth to the earth with glutenous threads where the slimy ones have crawled.

* * *

And over all, the gentian blue of the Santa Cruz sky, not a distant background in the park. It comes forward here through the forest aisles, outlines the leaves, upholds the flying motif of a bird's wings, circles and sweeps between and around the mosaic designs of meadow, glade, stream and rock, like the azure enamel of a Cloisanné vase. The sight wavers from the receding imagery to the device of the bright circling background.

In the forest, the eye can not always keep the contour of the outlined picture clear, the blue persistent sky is so prominently defined.

If there were no color anywhere in California save in the green of its ever verdant woods, the gold of its sunlight, the blue of its skies, these three vivid hues alone would make it a land of brilliant color. Without the

green and the gold, how intense and wonderful still the peculiar blue shadowed atmosphere, distinctive to the coast. In the East, duller skies and scarlet, orange, purple, crimson autumnal foliage. Throughout the Pacific States, a painted air immersing, changing, glorifying local color—brown to bronze, yellow to gold, leaden to violet, dense to diaphanous, pallid to prismatic, seeping down from the cobalt heavens, an illumined atmosphere that bathes the country in floating, rarified gorgeous dyes.

Fungi Gardens.

By Virginia Garland.

UNDER the fallen foliage is a hidden garden. Brilliant fungi flowers bud, bloom, ripen unseen to most eyes. Stir the matted leaves aside; scarlet and yellow and wine-red *Russulas* stud the soil, indigo blue *Leptonias* brighten the mould.

Some of these toadstools are poisonous, some are edible, but their thatched over color is always a wholesome lure to follow, leading one along a trail of ambushed enchantment. Hunt for a blue or red or golden knob under the thick leaf layers, turn it around and a door opens to happy secret chambers of beauty underground.

Here is a tiny closed pink parasol tinted in palest rose: through the chiffon fabriced folds, the delicate ribs show, pressed down about the stem. This little fungi plant is as fresh and lovely as a wild rose.

There is a small cream colored waxy agaric with the fragrance of some tropical flower. In the temperate dampness of these woods, you catch the odor of a breeze that might be wafting from citrus groves—so heavy and bitter-sweet the perfume.

Along a rotted trunk, hundreds of slanted receptacles filled with a black liquid looking substance, the tip tilted cups, however, never spilling their brimming contents

over. The black watery appearing stuff is as solid as the dull black bowls that hold it.

Infinite shapes, carved spikes, spatulate clubs, queer little spirals, rising from buried spruce cones, red snaky staffs uprearing.

An *Armillaria* brushed with stringy dabs of orange and red, laid on so thick they look like drying paint strokes.

Sometime the color is placed on the cap of fungi plants, sometimes a dull pileus conceals the brilliant hued plates beneath.

Here is a smoky colored cap, a *Cortinarius*; turn it over, the moist gills are so red they look soaked in blood.

Beds of egg yellow *Chanterelles*, toothsome to man and the big grey squirrel and the tawny fox and the fat skunk and coon, growing in abundance for all. Alabaster shells of the oyster mushroom, succulent flutings, tier upon tier, on an alder trunk spanning the stream. Sulphur and orange scallops of Polyporus bracketing the spruce trunks, for all their lurid color, dainty mouthfulls when fresh. They are more than a hundred different varieties of edible toadstools in the park; a full harvest for those who know how to gather and eat; another harvest for those who know how to garner and assimilate color. Sometimes we seem to be wandering on the floor of the ocean. Over the trail sprawl dark leathery starfish forms, —Geasters or earth-stars. White, pink and yellow corals, branch through the cracked wet earth; dainty shells are arrayed under branches. Big *Boleti*, like folded sponges, mussel-shaped black clusters, tendril-rimmed cup fungi,

mimicking ocean anemones; grasses for seaweeds, jewel-eyed salamanders, like slow loitering fish, snails crawling about, a salty tang in the air from the disintregating toad-stools and the sound of waves in the pines—one might fancy the earth had become freakish,

> "Working a sea change
> Into something weird and strange."

All these forms, this hidden color is not found in a day. Many walk over the hoarded reserves, scenting only the mould, seeing only some rotting ugly plant, that has pushed high above the leaves out of the cover where its beautiful prime is spent.

Nor is the decay ugly. Under the microscope, curious and pretty spore shapes swim in the dissolving substance. The rich humus of the park is replenished each year by rotting fungi. The waning mushroom is performing a wonderful, beautiful decline—that earth embraced return, which is in reality—restoration, new life.

THE SEQUOIAS.

By Charles Elmer Jenny.

God set seven signs upon this land of ours
To teach, by awe, mankind his wondrous powers ;
A river sweeping broadly to the sea ;
A cataract that thunders ceaselessly ;
A mountain peak that towers in heaven's face ;
A chasm deep-sunk toward the nether place ;
A lake that all the wide horizon fills ;
A pleasant vale set gem-like in the hills ;
And, worthy younger brother of all these,
The great Sequoia, king of all the trees !

A cradle, song, and bed the waters meant ;
The others, playground, grave and monument :
All wonderful, but cold and hard and dead ;
The trees alone, like man, with life are fed,
Like him have felt the stir to rise from earth,
To toil, to strive to heights of greater worth,
To breast the storms and know the north wind's rage,
And pass traditions down from age to age.
O'er four score spans of human life they see,
And whisper of their tales to you and me.

Some men have worshipped 'neath their mighty beams—
Some men have dreamed and told the world their dreams ;
Some men have lain most humbly at their feet
And sunk into the tired child's slumber sweet :
Some men—men?—have you seen plants wilt and worse,
Their base engirdled by the cutworm's curse?—
Such men with axe and saw have gnawed and gnawed
And felled to earth what never back to God
Their lives can raise—nor sons, nor grandsons raise,
Through penance of a thousand arbor days.

Bird Life in the Park.

By Virginia Garland.

ALONG any trail in the park, you will be sure to meet three large scratching birds—the California Towhee, the Spurred Towhee and the California Thrasher—mowing the dirt aside with his sickle bill.

Two of these birds are brown; the Thrasher has a long body, a great curved bill; the California Towhee is fluffy and fat, with a short bill. The Spurred Towhee is black headed, white and brick-red breasted, and he has decidedly red eyes, mildly pretty eyes for all their ruby glitter. The Thrasher's note is "quoy quoy," with an upward inflection; the Spurred Towhee calls "to-hee′, to-hee′," accent on the last syllable; the California Towhee or Chewink says his name shortly, emphasis on the first syllable—"che′ wink."

The bright colored Towhee's song is a peculiar vibrant trill on a descending scale, but so burred over it seems to sound on one note. The brown Towhee has a rather thin roundelay like shallow water gurgling about a stone, but the Thrasher is a marvelous singer, cousin he is to the Mocking-bird. No two birds sing quite alike, and they do not sing very often, so if you hear his rare performance some early, very early, Spring morning, that day is always set a little apart. Sweet, irregular phrasing, interspersed with drawling calls. You will not question

what bird is singing, if you have learned the peculiar timbre of his "quoy."

Now turn your attention to three sparrows, about the size of the English sparrow of town streets. The White Crown, the Golden Crown and the Point Pinos Junco. Their call notes are much alike, a clicking note resembling the urge we make to horses between closed teeth. The first two birds are plump and greyish, white stripes between black on the crown of one, dull yellow streaks with the black on the head of the other.

The Junco is smaller, black headed, greyish buff on his breast, and he shows a white flit of feathers, on the fanned out margin of his tail—his song a sunny warble. The White Crown sings the year around: two descending notes, followed by a triplet trill. He sings also in the night. In the moonlight or in the dark silence, his sudden rippling cadence overflows as if he was so full of music that it burst out of him in his sleep without conscious volition. The Golden Crown sings three descending notes, plaintively sweet. These six birds are resident wherever they are found in California.

If, when your visit to the park comes to a close, you have learned to identify these little brothers of the air, school-teacher, parent, laborer, or professional man or woman, you will carry away in your heart a lesson of infinite value. If you can say with authority, "There is a Junco—see the white flit of his tail; there is the Spurred red-eyed Towhee. Hark, a Thrasher is singing in the thicket," or if far away from the woods, you speak of the

California Towhee, the White Crown and Golden Crown Sparrow, you will never find the words come amiss, no matter when, how or where, you essay to use them.

We know that meadow larks do not frequent deep canyons, that blue birds do not build in the reeds by the river, but in learning to identify less common birds, we often forget that locality will help us to find their names as well as color and shape. And this, while it simplifies the search for classification, doubles and trebles our enjoyment of the woods and fields. The labor of scientific arrangement would be rather profitless if we did not absorb a part of the beauty of the outdoors with our task. When we make note of a bird's food, his manner of procuring it, his way of flying and so forth, we learn also something of insect life, something of the flora of a region, something of the loveliness of space, in which different landscapes are set. With the distinguishing range of a bird's habitat, we notice a hundred delightful things, that follow and surround and lure us on in the search for his name.

When walking over rocky, treeless, sun warmed slopes, and a little metallic songed wren bobs up and down on an outcropping stone, you will know him for the Rock Wren ; you will not confuse him with the Cañon Wren and you have a clear impression of the region he lives in; the rise of granite against the sky connected by curved lines of exposed sun beaten soil.

You see where his range ends down in the bushy hollows, or where the cool dark forests begin.

He disappears in a crevice of the noduled stone, creeping through a crack he knows; there he is again, bowing and singing on a distant rock. So you come to see the beauty that lies upon grey stones, the blue shadows that circle them, the crumbly dabs of rust-red lichens and the flat spreading grey green lichens that color them over. The Rock Wren will open your eyes, to more than his mere name and habits. A vague undefined and undefining enjoyment of Nature gives but small reward. We seem to be so constituted that idle dreaming is seldom beneficial. It may be even dangerous to enter the realm of the Open without some obvious thread to guide us, some search to quicken our perceptions. You find this little grey brown wren, with a black band across his tail, has a somewhat flinty tinkle in his song and you begin to understand how close is the association between sound and matter; how unconsciously the birds are forever interpreting and echoing what they hear and see. The wind infringes upon this hard rock strewn, barren ground with a hot, monotonous sweep, and the Rock Wren, hearing nothing but the whiff of breezes blowing through the unyielding cracks and runways of his stony haunts, sings a stiff, wheezy little lay that seems to fairly crackle with cheerful heat.

* * *

Doubtless when you think of a wren, you picture a small bird with short wings and tip tilted tail, but the big Mocking-bird, the Catbird and the Thrashers all belong

to the wren family. The California Thrasher has among some others, four little kinsfolk in the Big Basin, the Rock Wren, the Cañon Wren, Vigor's Wren and the Winter Wren.

The Dotted Cañon Wren is described by his name. If you add the White Throated Dotted Cañon Wren, his image and locality is clearly impressed upon your mind, and you will surely know when you meet him on the banks of a deep ravine. What would you expect to hear in his song? Not the crisp, sunny, metallic music of the Rock Wren. Among all the sounds of his habitat, he hears most distinctly the drop and flow of water plashing down the center of the cool ravine, and his song runs as liquidly clear, through often louder tones, as the voice of the stream penetrates below and above, all the inarticulate sounds of the forest. His song pours out of him in seven or nine descending notes, ending in a round purling, eddying trill. Sometimes he closes his refrain by doubling back on the first notes, a sweet, wild recoil of fluent tones, reproducing the duplex bubble of swift water reverting upon itself. He has been called the "Bugler," and this quick rebound of coiling notes is not unlike the back winding, rallying call of some elfin horn.

* * *

All the small wrens have very similar call notes, harsh syllables which sound like "crick crick," in alarm running together in a long scolding clatter. How unlike the calm, questioning "quoy quoy" of the big Thrasher.

Vigor's Wren you are likely to find everywhere about village houses or in the far forests. He is another fine singer, a mimic, too, for mockery is a strong characteristic of the wren family.

But in the wilderness of the Basin, there are many melodies as sincere and joyous as his simple little strain. and there his song has a richer quality, a more ebullient rise and fall. In the way of wrens, he often reverses his song, sometimes beginning and again ending with tumbling grace notes. Vigor's Wren is silver breasted, dark brown on the upper part of his body, lighter beneath; a long, narrow white line curves over his eye.

And now we come to the tiny Winter Wren, the smallest wren in the West, perhaps the smallest in the world, certainly in the park, living among the largest trees in the universe. A brown, shadowy mite, difficult to see, flickering in and out of the prostrate boles. Look for him on the ground, never in the high branches. He is also dotted and barred, but you will not confuse him with the Cañon Wren, if you have said to yourself "the White Throated Dotted Cañon Wren"—he is so much smaller and has no soft white patch under his chin. His call note is a faint, short "click," but his song is so clear and loud, it sounds out of proportion with the stubby tailed wee creature, and it has also a wandering, meandering quality that seems to carry it up and down and far away from the feathered midget, delving in the depths about a mossy log.

A strange breathless song cut off quickly without an ending cadence, as if some sudden interruption had caused the singer to shut his bill and swallow his notes in half a second. Back and forth on rapid tones he sings, with no rests between, rising and falling into different keys, with a movement that sounds blown up and down by the swell and drift of the wind, not controlled by the bird, and ceasing as if a stone wall had come between you and the singer, leaving you with the thought that the cool, breezy zigzag is continuing, as the wind goes around a buttressing hill out of hearing.

Perhaps in a week or a month, it may be in a year, you will learn the names, localities and manners of ten birds. You have not lost time if it takes you twelve months to know these few, for no moment given to the woods and fields is ever lost.

You may start out to find a bird and find a river in its stead. You may hunt for a common ground bird and be given the sight of a flock of rare warblers feeding in the top spires of a spruce. You may return home without a bird adventure, a friendly talk with some staunch oak to your credit instead. In looking for the region of certain birds, you may lose sight of the bird entirely and see as you have never seen before the beauty of alders marching in a winding procession along the river margin, the bosomed curve of bare hills, or the sun flecked turn of forest trails. As you seek your heart and mind will be filled. The bird or bee or butterfly you trail may be hid-

den, but other visions crowd into its place. For no asking hour is left void in the Open.

In some shut in day, say your five sparrows and your five wrens over, with descriptive adjectives.

SPARROW FAMILY.

The White Crowned Sparrow.
The Golden Crowned Sparrow.
The Black-headed Point Pinos Junco.
The fat, fluffy, big brown California Towhee.
The red and black and white red-eyed Spurred Towhee.

WREN FAMILY.

The big, brown, sickle-billed California Thrasher.
The small, greyish, black-banded tail Rock Wren.
The brown, White Throated Dotted Cañon Wren.
The silver breasted, white eye-browed, brown Vigor's Wren.
The wee, brown, shadowy Winter Wren.

With these names will come the uplift of rocky mesas, the far leafy paths of the woods, the cool ramparted cañons, wayside thickets, stretches of chaparrel, and the mossy shrines, in the distant redwoods.

The Green People.

By Virginia Garland.

ALL over the park, birds, waterfalls, canyons, hills, shrubs, and trees, are gradually learning a new sympathy with mankind. The mighty redwoods no longer stand in aloof austerity. Here and there certain trees have not yet unbent; their towering branches are heavy with an ancient sighing that makes moan for the days of long ago, but for the most part the trees have responded to new kindly influences. Whether we imagine this or not is of small matter since our protective attitude has brought about a change in us which conceives their change possible. The trees in the park are guarded, and one result is our better understanding of and a closer communion with Nature. Are these trees, inanimate, unfeeling, or are we too often obtuse, unfeeling toward them?

Stand in the sad, sold woods of Oregon, the dark and doomed forests of northern California, and the most stolid feel a reflex impression of unconquerable gloom. This depression is not all climatic, for the National Parks in the same territory lack in an appreciable degree the heavy melancholy that lies over betrayed woods.

Even the men who gloat upon the wealth this timber brings hurry away from a nameless dread they feel, but which they would hardly acknowledge as coming from

the trees. And with those who must labor year after year in the lumber camps, there is more insanity than among any other class of outdoor workers.

When quite outside of our knowledge of commercial conditions, of what fate hangs over the forest, we are in the main made sad in some woods, and soothed and cheered in others; are we far from the truth in thinking that the trees directly incite our mood and that their mood is influenced by conditions we impose upon them? The forces that breathe from a tree are as complex as the forces that breathe from a human being.

It is not easy to keep the logical sense between cause and effect clear and true in studying humanity. It sometimes happens that we make out our own kind to be strange, unreal, inhuman with the best philanthropic motives. How much more difficult to see and hear the Green People aright whose wordless protest, whose speechless assent reaches only that fine far inner sense of vision and hearing.

We know that forests in the mass have a direct bearing upon rainfall and weather, as we know that the rise and fall of nations affect prosperity in certain result; but when we refine our reasoning upon the unseen agencies that act through individual trees, or upon the invisible powers that bear from one human medium to another, we are in a realm of conjecture that might be called imaginary no less in one than the other instance, but which signifies further, deeper, more intrinsically than some unimpeachable argument of merely material interaction.

We once thought good forestry only a matter of sentiment. We are finding that State and National Parks have their physical and moral as well as esthetic value. The pleading, the threatening, of outraged Nature is interpreted by the poet long before the idea works its way into the hard utilitarian brain. So if some of us hear the trees speak, hear their long wailing call when they go down under the axe, hear the answering battle cry of sky and sea, hear their beneficent murmur, their rustling benediction when they are loved and cherished, we are not idle visionaries. The day is coming in the near future when the reckoning, controlling, practical portion of humanity will recognize that the life of a tree is a different expression of and stupendous factor in the life of the whole world. When we destroy our forests, we fling war into the teeth of the elements, that army whose rank and file we are indeed ill fitted to battle with; when we separate and deaden the soul of a tree, we are segregating and making void just so much power in our own spiritual growth.

* * *

The trees in Sempervirens Park are looking down on a different manner of men; workers who delve about their mighty roots, clearing away restricting litter, opening paths along the streams, freeing the choked water, tender of the tiniest vine, regardful of every mossy patch and ferny corner, removing only the cumbering rubbage. A labor of elimination that does not destroy but which clears, opens, reveals.

The great trees know the tangled native plants will not be margined by silly box borders. The madroño and oak will lean to the Redwoods' sky touching shafts unfretted by the dissonance of foreign trees. What is left of the wilderness of the park will remain as it was planted before the Pharaohs and the miracle of that companion summoned wreathing and arboring in which man has had no hand, will continue. For the men and women into whose care this wonderful domain has come, know that there is no landscape gardener like Nature, no planting possible that can excel the exuberant, infinite sowing of the sun and wind and rain. The calling of the redwoods, the answering of the elements will go on without the bungling interference of humanity.

As a road is leveled and strengthened about the contour of the hills, the birds will drop along its bare margin a twined line of beauty; purple thistles and feathery fireweed and the first transverse sprays of blackberry vine will use these as a support, until their runners are sufficiently vigorous and the thorny mound rests upon its own strong arches.

When the dead brush is taken from a shady dell, oxalis and wood violet and vancouveria will quickly carpet the hollow. Where a lifeless jagged limb obstructs the view, breaking the jutting curve of stony banks and is lowered to its earth place, the engraver beetle will trace thereon his pretty biting etchings, the rotting trunks will soon be absorbed in living moss and lichen.

Through stony cliffs cut and laid bare, the rock break-

ing saxifrage will push and heave hanging rosetted festoons from every crevice.

Following close upon the removing, invoking toil of men, an answering principle in the fecund earth, covering over, renewing, restoring out of the boundless mystery of Life.

* * *

And the great trees watch and wonder much. Surely a new race is coming on down there; men who measure their girth in love, not in greed, taking the place of creatures they used to dread more than rot and disease, more than the wrecking fateful winds, more than the blasting, consuming fires.

Through their branches the almost unbelievable message runs—"These men worship God with us."

THE TREES OF EDEN.

AN INVOCATION.

And God said, let the earth bring forth grass, and the herb yielding seed and the fruit tree yielding fruit. * * *

And the evening and the morning were the third day. * * *

And the Lord God planted a garden eastward in Eden. * * *

And out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food. * * *

And the Lord God took the man, and put him in the garden of Eden to dress it and to keep it.

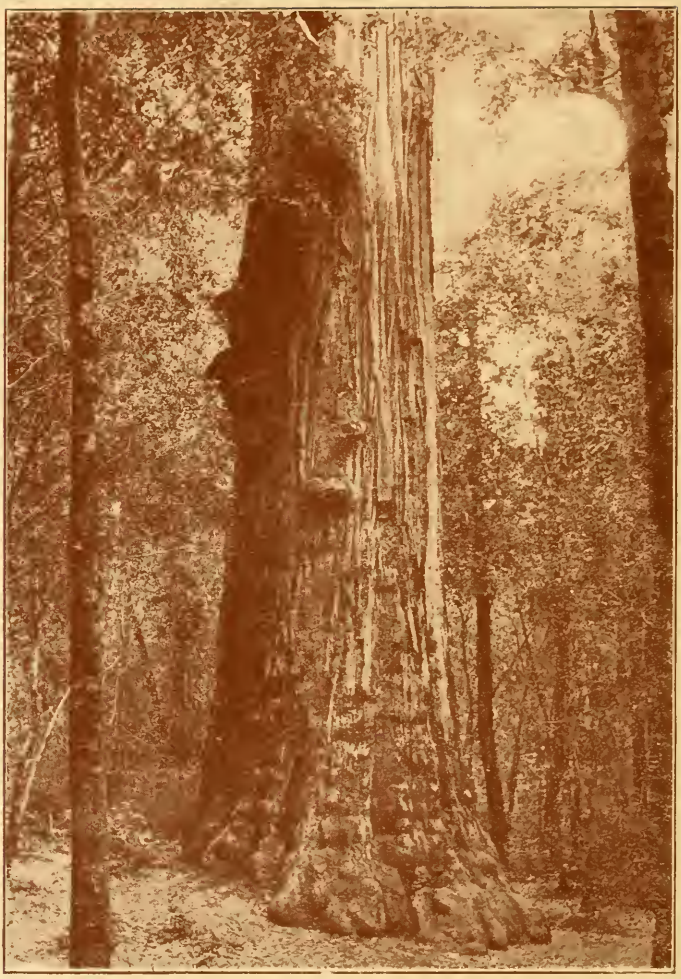
BY JOAQUIN MILLER.

Behold this miracle, the tree,
  The third day's miracle, behold
What stateliness, what majesty,
  What comeliness, contour, what mold
Of limb, of leaf, of arms in air
  High held in attitude of prayer.

And yet we hew, and slash and slay
  God's first born, "pleasant to the sight,"
And set, ere he laid hand to clay
  And fashioned man to burn and blight.
We see no grace at all; behold
  We only see the sodden gold.

The sweet name Nazareth means wood.
  The Christ companied with the trees;
He read their leaves, he understood;
  His alphabet the birds and bees.
Give us, oh God, to heed, to hear,
  To love, to cherish, to revere.

Give us to heed how clean, how tall;
  Give us like courage, patience, strength,
To front the four winds, strength to fall
  Serene and satisfied, full length
And full of years and majesty,
  As falls thine Eden fashioned tree.



The Chieftain.

The Redwood.

STATE FORESTER HOMANS officially describes the redwood in these terms:

Under normal conditions of growth the redwood develops a long, cylindrical bole, clear for two thirds of its length, and surmounted by a narrow, tapering crown. Exceptional trees have measured 350 feet in height and 20 feet in diameter.

Average dimensions of the trees customarily logged are 200 to 275 feet in height, and 3 to 10 feet in diameter, and their ages run from four hundred to eight hundred years.

In early life, the redwood grows rapidly both in height and diameter. Later, the growth falls off, and in old age is extremely slow. Instances are not rare of an old redwood increasing in diameter only six inches in the last three hundred years.

Though a fairly prolific seed bearer the redwood rarely reproduces itself by a seed. It sprouts readily from the stump and root-collar, and suckers from the roots; and it is probable that the majority of trees now forming the forest originated in this way.

This power of reproduction from sprouts is a property denied to conifers in general.

Another writer says of this process:

When the deadly axe has felled a stately redwood, when the "tree" has disappeared, the massive stump sends up from its circumference a fringe of shoots that grow to saplings, and they to trees, that in the lifetime of a man absorb the growth that gave them birth, and in a few decades they tower—a ring of

comely "giants"—with interlocking branches shading their ancestral birthplace and grave.

The tree has very few enemies, and is well protected against them. The thickness of its bark make it invulnerable to all but the hottest fires, and its wood, also, containing no resin does not burn easily. Very few fungous diseases are dangerous to it.

The vitality of the tree is also remarkable. It not only lives to an astonishing age, but after being cut it sprouts repeatedly, using the quantities of nourishment stored in the enormous roots. And although successive forest fires will finally kill the stump, it will remain in the soil indefinitely without rotting.

Redwood bark is of a reddish-gray color, fibrous in texture, and gives to full-grown redwoods a fluted appearance.

The wood of the redwood varies greatly. The softest and best trees usually grow in the bottoms, the "flinty" timber occurs on the slopes. But this rule does not always hold good. All sorts of unexpected and unaccountable differences in the quality of the timber occur. A soft, fine-grained tree will be found close beside one "flinty" and less valuable. Even the practical logger is never sure until he cuts it what kind of lumber a redwood will yield. The tree's vitality is so great, it endures so many vicissitudes and suffers from so many accidents in the centuries of its existence, that the grain of its wood becomes uneven in proportion as its life has been eventful. The wood fibers formed under different rates of growth sometimes get up a tension so great that when the log is sawed the wood splits with a loud report.

In color redwood lumber shades from light cherry to dark mahogany. It is easily worked, takes a beautiful polish, and is one of the most durable of the coniferous woods of California. It resists decay so well that trees which have lain 500 years in the forest have been sent to the mill and sawed into lumber.

Ante-dating History.

"The redwood tree is interesting for its size," says Professor Sargent, "but it is more interesting as the sole representative, with the allied species of the Sierras, of a race of giant trees which before the glacial period were widely spread over the northern hemisphere."

While it is true that no specimen of the *Sequoia* family has been found in any part of the globe except California, and in limited areas here, it is claimed that it has been discovered in a fossil state on Disco Island in Baffin's Bay, far within the Arctic circle.

Among the relics of the cave man that have been found in Europe are pieces of redwood trees.

The petrified forests of Arizona are supposed to be remains of *Sequoia* forests which "went down to the primeval sea," were covered with sandstone and rose again.

Discovery and Name.

Discovered at an unknown early date, the coast redwood was first described and published by Lambert of London in 1803, under the name of *Taxodium sempervirens*—he thinking the trees formed another species of the well known *Taxodium* or bald cypress of the Eastern States.

In 1847 Endlicher, a German botanist, believing that it was a distinct genus, published it under the name of *Sequoia*. This author, contrary to custom, omitted to

give the origin of his name, and botanists have conjectured that it was intended to commemorate "Sequoyah," a half-breed Cherokee Indian, who, all by himself, invented an alphabet and taught it to his tribe by writing it upon leaves. This alphabet came into general use among the Cherokees before the white man had any knowledge of it. In 1828 a periodical was published in it by the missionaries. Sequo Yah was banished from his home in Alabama with the rest of the tribe and settled in New Mexico, where he died in 1843.

Sequo Yah's alphabet consisted of eighty-five characters, one for each sound in the language; and it was so simple that in a few weeks a Cherokee could learn to read and write. Some philologists pronounce it the most perfect alphabet ever invented.

It seemed fitting that the redwood should be named for the red man, yet Prof. J. G. Lemmon and others consider it to have been derived from sequor (to follow) alluding to the fact that our redwoods are the followers of a vanishing prodigious race, which Prof. Lemmon considers a much more appropriate and pleasing origin for the botanical name of our monster tree.

Age.

Prof. B. E. Fernow is probably the foremost authority in forestry in this hemisphere, if not in the world. He is a very highly educated German, and was connected with the Department of Forestry in the German Empire, later head of that department in the State of New York, and

professor in Cornell; and is now at the head of the Department of Forestry in the Dominion of Canada, and a professor in the University of Toronto.

Professor Fernow spent some time a few years ago in this forest. He said that it was impossible to determine with any degree of certainty its age; that the usual tests, such as counting the rings, and the like, were misleading and untrustworthy.

His own estimate was that two thousand years was the probable limit of the age of the oldest of the trees. Possibly, but not at all probably, some specimens might be older. At the same time, he did not profess to speak with certainty or assurance.

The count of rings on a redwood tree recently felled in another part of the State showed that the tree began life 525 B. C.

Some years ago, the late Prof. William Russell Dudley, of Stanford University, wrote a life history of a redwood. The tree in question was one of moderate size, about fifteen feet in diameter, five feet from the ground. It was 270 feet in height and 2,171 years old. The history of the tree was as follows:

B. C. 271 it began its existence. The first year of the Christian era it was about four feet in diameter about the base. A. D. 245, at 516 years of age, a burning three feet wide occurred on the trunk. One hundred and five years were occupied in covering this wound with new tissue. For 1,196 years no further injuries were registered. A. D. 1441, at 1,712 years of age, the tree was burned a second time, in two long grooves, one and two feet wide, respectively. Each had its own system of repair.

One hundred and thirty-nine years of growth followed, including the time of covering the wounds. A. D. 1580, at 1,851 years of age, occurred another fire, causing a burn on the trunk two feet wide, which took fifty-six years to cover with new tissue. Two hundred and seventeen years of growth followed this burn. A. D. 1797, when the tree was 2,068 years old, a tremendous fire attacked it, burning a great sear eighteen feet wide. One hundred and three years enabled the tree to reduce the exposed area of the burn to about fourteen feet in width.

Other Aged Trees.

There is a famous plane-tree in the Ægean island of Cos which is said to be at least a thousand years old. But it is said that there is in Europe no tree that can be proved to be more than eight hundred years old. The tree from which is said to have glanced the arrow that slew William Rufus in the New Forest was in existence in the eighteenth century, when it was replaced by a stone in 1745.

The Tortworth chestnut—supposed to have been formed by a junction of two trees—was mentioned as a boundary mark in a record of the year 1135. The Swilear Lawn oak in Needwood Forest is proved by documents to have been at least six hundred years old.

An oak at Tilford, near Farnham, is supposed to have been referred to in a charter granted by Henry de Blois in 1256.

These are some of the tallest trees in Britain: the "Queen Beech" at Askridge Park, 135 feet high; the silver firs at Luss, Loch Lomond, 121 feet high; and some beeches near Glasgow, which are 118 feet high.

Non-inflammable.

Redwood lumber contains no resin or turpentine of any kind, and owing to its great resistant qualities of severe climatic conditions, is free from cracking or decay, where cinders might lodge and start fires. When burning it is easily extinguished with a small quantity of water and has the appearance of burned cork, and is harder to ignite a second time than at first. When the famous Baldwin Hotel of San Francisco was burned in the most densely populated part of the city, the firemen confined the flames to the building only; and while the heat in the interior of the building was sufficient to melt cast iron, the weather boarding (which was of redwood), by applying the hose to the outside walls, remained almost intact when the fire had been extinguished within, after it had burned fiercely for five hours.

At the time of the destruction of San Francisco by fire following the earthquake of 1906, the Southern Pacific Railroad Company saved their depot and yards, built of redwood lumber, south of Townsend street, with their own employees and private fire-fighting facilities.

Redwood forests are practically unharmed by forest fires, and it is common practice for the lumbermen to fell the trees and peel the bark from them and, when the dry season is on, set fire to the felled timber and burn the branches and bark and other wreckage without practical injury to the saw logs, which procedure would mean disaster to any other wood.

Photo by Hill.

United Oaks.

Sentiment and Shingles.

WHEN Theodore Roosevelt first stood under the shadow of a redwood, he said:

Here you have some of the great wonders of the world. You have a singularly beautiful landscape, singularly beautiful and singularly majestic scenery, and it should certainly be your aim to try and preserve that beauty and keep unmarred that majesty. There is nothing more practical in the end than the preservation of beauty which appeals to the higher of mankind. Take a big tree whose architect has been the ages, anything that man does toward it may hurt it and cannot help it. I feel most emphatically that we should not turn a tree which was old when the first Egyptian conqueror penetrated to the valley of the Euphrates—into shingles.

That same season a single tree within six miles of where Mr. Roosevelt stood was converted into shingles, with the result: Yield of tree—66,000 shakes, which sold for $14 per 1,000, and 300 railroad ties, which sold for 38 cents each.

To give reader and visitor an estimate or basis of comparison, it may be stated that the tree at the Governor's Camp, sometimes called "The Daughter of the Forest" and sometimes the "Princess," is what the timbermen call a good shake tree, and it is calculated that it would yield about 60,000 shakes.

Commercially-minded men find it difficult to compute a sentimental value in excess of these figures, yet cash put into a cathedral could not produce the sanctuary effect of these upward shafts that blend the heavens and the earth.

Tributes to These Trees.

NOTABLE among the word-paintings drawn of this forest, is the one wrought by D. M. Delmas, and delivered before the Legislature at the time the bill was pending for the purchase of the park. Previous to its delivery Mr. Delmas had spent several days in the Big Basin.

In the heart of the Santa Cruz Range this chosen spot is found. It presents to the eye the aspect of a vast amphitheater whose encircling walls are the dim heights of mist-crowned mountains. Seen from the crest of the ridge it stretches toward the setting sun, its distant outlines blending the purplish-blue tints of the woods with the hazy vapors of the ocean. From this point of view you catch a confused suggestion of a great forest watered by intersecting streams. Descend from your eminence and enter within the limits of the forest. Your first feeling is one of awe. Your very breath seems hushed by the solemn stillness of the place. Here the winds are mute. Their distant murmurings are unheard within the depths of the shaded solitude. Your step falls noiseless upon the thick carpet of marl—the cast-off vesture of countless seasons—upon which you tread. The crackling of a twig under your foot or the startled cry of a frightened bird but intensifies the silence which enfolds you like a shroud. Contemplate now the scene spread on every hand in never-ending vistas. See the great moss-covered oak, the light and graceful maple, the glossy laurel, everywhere entwining their branches and blending the varied hues of their foliage in tangled profusion, while here and there the glistening trunks of clustered madroños stand out against the dark background like streaks of yellow sunlight. As you lift up your eyes, behold above the giant forms that sentinel the place. These are California's own—hers, for in no other soil

have they ever found root and under no other breeze save that of the Pacific have they ever swayed their boughs.

A sense of humility overwhelms you as you gaze upon these massy pillars of Nature's temple, whose tops, lost amid the clouds, seem to support the vault of the blue empyrean. The spell which the mystic light of some venerable cathedral may at times have thrown upon your soul is tame compared to that which binds you here. That was man's place of worship; this is God's. In the presence of these titanic offsprings of Nature, standing before you in the hoar austerity of centuries, how dwarfed seems your being, how fleeting your existence! They were here when you were born; and though you allow your thoughts to go back on the wings of imagination to your remotest ancestry, you realize that they were here when your first forefather had his being. All human work which you have seen or conceived of is recent in comparison. Time has not changed them since Columbus first erected an altar upon this continent, nor since Titus builded the walls of the Flavian amphitheater, nor since Solomon laid the foundations of the temple at Jerusalem. They were old when Moses led the children of Israel to the promised land, or when Egyptian monarchs piled up the pyramids and bade the Sphinx gaze with eyes of perpetual sadness over the desert sands of the Valley of the Nile. And if their great mother, Nature, is permitted still to protect them, here they will stand defying time when not a stone of this capitol is left to mark the spot on which it now stands, and its very existence may have faded into the mists of tradition.

* * *

David Starr Jordan, President of Stanford University, has said:

California Redwood Park is a leaf from the greatest of virgin forests, a sample of the redwoods as they have been for ten thousand years, and one which may be preserved for all times.

Besides this, it is a botanical garden where the wax myrtle, the California nutmeg tree, the California whortleberry, the clintonia, the oxalis, and all the other plants which follow the redwoods may be likewise saved for our descendants.

* * *

United States Senator Perkins has said:

I have traveled through the forests of Mariposa, and I have driven through the wonderful forests of southern Germany, yet I have never seen the equal of California Redwood Park.

* * *

In some unknown way this forest has come down to us from probably the pliocene age, bringing with it in all its native loveliness and primeval beauty its flora, consisting of its giant trees of sempervirens and embracing some fifty-two varieties of other trees. According to botanists, the Big Basin contains no moraine, neither lateral nor terminal, which clearly shows that it has not been at remote periods even visited by glacial action, and proves it to be of primeval origin and one of the oldest spots known to man.

Surrounded by its great mountain rim, protected for unknown ages, it comes to us as a heritage from God, and in all its weird aspect it gladdens the heart, inspires the mind with the thoughts of the boundless powers of the Creator, and as we stand gazing at the giant trees, massive, tall, stately and grand, we are tempted to exclaim "They are the real temple of God!" We see in them the key to every church tower, and the lines and angles of our famed gothic architecture.

* * *

By G. Frederick Schurtz: "The beauty of the forest is not simply in character, but is due to many separate

sources. The trees contribute much ; the shrubs, the rocks, the mosses play their part ; the purity of the air, the forest silence ; the music of wind in the trees—these and other influences combine to produce woodland beauty and charm."

* * *

Although John Burroughs was never in the forest, he delineates it perfectly when in one of his essays he says : "The book of nature is like a page written over or printed upon with different sized characters, and in many different languages, interlined and crosslined, and with a great variety of marginal notes and references."

Photo by Hill.

Pine and Oak.

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